FEBRUARY 25, 1924

THE RUBBER AGE

VOL. XIV. NO. 10

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THE RUBBER AGE

The Only Twice-a-Month Rubber Publication

VOL. XIV. FEBRUARY 25, 1924 No. 10

GOODYEAR 1923 SALES AMOUNT TO $106,026,109

Gross Increase of $3,000,000 Shown Over 1922 Figures—Net Profits are $6,507,245—Low Prices Held Profits Down—Wilmer Hopeful for Greater Improvement This Year.

The Goodyear Tire and Rubber Company reports net sales of $106,026,109 for 1923 against $102,904,177 reported in 1922, according to the annual report submitted to stockholders and released on February 6.

These figures exclude sales by the Goodyear Tire and Rubber Company of California in territory west of the Rocky Mountains and sales by The Goodyear Tire and Rubber Company of Canada, Ltd., in Canada. The total combined Goodyear sales of the Akron, California and Canadian companies and foreign branches were $127,880,082 in 1923 and $120,450,800 in 1922.

After payment of all operating expenses and general deductions, reserves for interest and other charges, net profits for the year were put at $6,507,245, including the profits of the California company. In 1922, excluding the profits of the California company, there was reported net profits for the year of $3,551,182.

The detailed income account for the year ended Dec. 31, 1923, follows:

Net sales	$106,026,109
Manufacturing cost, &c.	95,250,572
Operating profits	$10,775,537
Net operating profits of subsidiary companies	1,944,590
Total earnings	$12,720,127
Deduct profits of California Company	641,396
Balance	$12,078,730
Interest charges and premiums	4,410,786
Balance	$7,667,943
Deduct other charges	1,802,095
Surplus	$5,865,848
Profits of California Company	641,396
Profits and surplus for year	$6,507,245
Add—Surplus at Dec. 31, 1922	8,008,542
Total surplus	$14,515,788
Dividends prior preference stock	2,729,652
Surplus Dec. 31, 1923	$11,786,136

The balance sheet on Dec. 31, 1923, shows net current assets of $56,584,789, against net current liabilities of $7,612,707. Current assets included inventories valued at $28,355,175, accounts and notes payable $11,225,502, marketable securities valued at $799,462, call loans $3,000,000 and cash on hand $13,204,649. Current liabilities included accounts payable of $4,190,837, acceptances payable $1,875,973, accrued interest totaling $1,245,896 and accrued dividends $300,000.

E. G. Wilmer, Chairman of Directors of the company, in a statement said:

"During 1923 the company acquired by purchase $14,902,500 par value of its prior preference stock, reducing the outstanding amount of that issue in the hands of the public to $15,000,000. There were also redeemed and canceled $1,500,000 of its first mortgage bonds and $2,500,000 of its debenture bonds. Provision has been made for retirement of an additional $1,500,000 of debenture bonds on March 15 next. Between March 1, 1921, and March 15, 1924, the aggregate of first mortgage bonds, debenture bonds and prior preference stock outstanding in the hands of the public will have been reduced by a total of $22,652,500.

"The increase in physical volume of product sold in 1923 over 1922 was substantially greater than that indicated by the dollar sales. In spite of large volume 1923 was keenly competitive throughout, with pressure mainly centered on selling prices, which continued to go down. Sales are being currently obtained in heavy volume for this season, and, with every effort directed to greater economy of operation, we look forward to satisfactory business in 1924."

AKRON TIRE PRODUCTION

Reports from the rubber metropolis indicate that the production of tires during January shows a slight increase over December. With the increasing production of balloon tires, manufacturing schedules of Akron tire producers called for 100,000 tires a day. At the time of the recent decrease in balloon tire prices announced by Firestone, it was said that that factory alone was manufacturing 2,500 balloons daily and that this figure would be increased to 5,000 in the near future. Other Akron plants probably bring the daily production of balloon tires up to about 5000. Little or no additional labor is being hired at the present time, a surplus being noted.

1923 TIRE EXPORTS SHOW INCREASE

The Value of Tires and Tire Sundries Exports in 1923, $20,320,753, was less than in 1922, $20,702,982, but the Volume was Greater.

The average unit value of automobile casings exported from the United States in 1922 was $12.52, in 1923, $11.22 according to a statement recently issued by E. G. Holt, of the Rubber Division of the Department of Commerce. Meantime fabric tires were displaced by cords in export trade, which means that cord tires were sold as low in export markets during 1923 as fabric tires were in 1922. The unit value per inner tube shipped decreased from $1.89 in 1922 to $1.71 in 1923, notwithstanding the fact that in 1923 the average price of crude rubber was about double that in 1922. Exports of solid tires for motor trucks registered extraordinary gains in the past year.

Principal Markets for Casings and Tires

The United Kingdom was the leading market for automobile casings and solid tires, taking 24.2 per cent of the former and 32.4 per cent of the latter. Argentina, Cuba, New Zealand, and Mexico each took over 70,000 casings during 1923, while 8 markets took from 30,000 to 60,000 casings each, and 12 took from 10,000 to 25,000 each.

Shipments of casings and tubes to individual markets vary widely, the tube exports being much lower, as a rule. Only in the cases of British South Africa, Venezuela, and the Dominican Republic were exports of tubes heavier than those of casings. New Zealand, Japan, Canada, and the Straits Settlements took less than half as many tubes as casings, and even to such markets as Argentina, Cuba, Mexico, the Philippine Islands, Denmark, and Norway exports of tubes were lower than those of casings.

The trade with Canada in tire-repair materials is surprisngly large, and suggests the possibility of material for use in tire manufacture shipped to Canadian branch factories from American plants having been classified under this heading. A similar possibility exists in the case of tire-repair materials shipments to France, which amounted to 58,505 pounds, valued at $43,742. For detailed statistics see page 385.

RECEIVER FOR MARATHON; TWO OFFICERS RESIGN

Following closely upon the appointment of Walter H. Jenks as receiver for the Marathon Tire & Rubber Company, Cuyahoga Falls, Ohio, on January 29, it was announced that both G. Miller, Vice-President and Sales Manager, and Raymond Jenks, Secretary, had resigned, effective January 31. Mr. Miller was reported to be going with the Jones Laughlin Steel Corporation while Mr. Jenks was coming to New York.

The appointment of President Jenks as receiver followed closely upon the filing of a suit in the Federal Court in Cleveland on January 27th by creditors who alleged that the liabilites of the company are $400,000 while $100,000 of that sum is in discounted paper held by banks. In view of the friendly character of the suit, Judge Paul Jones appointed Mr. Jenks to act for both the creditors and the company.

Tire Trade with So. America

During 1923, South America will have been the destination of about 500,000 automobile casings exported from the United States, France, Germany, Canada, Great Britain, Italy and Belgium. The United States wil secure about 45 per cent of this trade, says E. G. Holt, Assistant Chief of the Rubber Division of the Department of Commerce, in an analysis of the Latin-American market.

It is estimated that the Argentine market will take approximately 285,000 casings this year, and on the basis of statistics thus far available, the United States will secure 42 per cent of the trade; Canada, 18 per cent; France and Germany, 12 per cent each; the United Kingdom, 8 per cent; and Italy, 7 per cent.

During 1922, the United States exported 89,561 inner tubes for automobiles to Argentina; in the first 10 months of 1923, 95,216.

It is estimated that the number of automobiles in Brazil is about 28,000, of which 1,600 are trucks. Brazil is the second largest South American tire market. During 1922, Brazil took approximately 105,000 automobile casings, the United States leading with 48,033.

Salem Sales Satisfactory

President E. A. Tinsman of the Salem Rubber Co., Salem, Ohio, reports sales for 1923 of approximately $500,000. This plant, formerly occupied by the Ideal Tire & Rubber Co., now is producing about 250 tires a day, which is 55% of its capacity. Plans are being made to increase the capacity to 700 a day, and to double last year's business in 1924. Balloon tires for standard rims are being manufactured in large quantities, according to Mr. Tinsman. The company's products find a large outlet through a number of department stores in New York, Pittsburgh, Chicago and Cleveland, as well as through a leading mail order house. 75 workers are employed in two shifts.

"RUBBER INDUSTRY NOT ECONOMICALLY EFFICIENT"

So says a financial writer in a New York newspaper in discussing 1923 business.

"With a good demand for tires and a low price for raw materials," writes the author, "the rubber companies should have made big money. The industry, however, is not organized on an economically efficient basis, according to business authorities. Stabilization can only come, it is thought, by a decided change in selling methods or consolidation of rubber companies."

Request for Unpublished Data

The Editorial Board of International Critical Tables will appreciate receiving from scientific investigators any numerical data which they are able and willing to furnish, which have not been published prior to January 1, 1924. All data are desired which characterize the behavior of any definite material, substance or system. For the purpose of this request, such data will be divided into two classes, as follows: Class I: data which constitute the only information of the kind available; Class II: data which, in the opinion of the investigator, substantiate, extend or improve upon existing information of the same kind.

In connection with data belonging to both classes, the following information should be given: (a) an exact definition of the material, substance, or system to which the data apply; (b) the investigator's estimate of the accuracy of the values; (c) the name of the investigator or investigators responsible for the measurements; (d) the laboratory in which the investigations were carried out; (e) a brief statement of the experimental method used; (f) an exact statement of the units in which the data are expressed; and (g) any other supplementary information necessary for the complete characterization of the data.

For data belonging to class II, such additional data should be furnished as will enable the Expert in charge of this class of data to critically evaluate the new in comparison with the older data. Manuscript or corrected page proofs should be furnished when possible.

Any data belonging to class I received prior to January 1, 1925, and any data belonging to class II received before July 1, 1924, will be in time for inclusion in International Critical Tables, and the source of all data so included will be indicated by "Private Communication from, etc." or in such other manner as the author may prefer; unless a literature reference becomes available before going to press. Data determined by members of the staff of a research laboratory should be forwarded through the Director of the laboratory. All data should be sent to International Critical Tables, National Research Council, Washington, D. C.

WUCHTER ELECTED HEAD OF SOUND RUBBER COMPANY

At a meeting of the trustees of the Sound Rubber Co., Tacoma, Wash., on January 28, W. W. Wuchter was elected President and General Manager, a position similar to the one he has held in the Nebraska Tire & Rubber Co., Omaha, Neb., for a number of years.

The opportunities presented in the Northwest for a progressive tire plant led Mr. Wuchter to consider the change. Tacoma is an excellent location for a medium sized tire plant, it is said.

Mr. Wuchter's experience in tire manufacturing embraces a period of 30 years, including service in two of the largest tire plants in the country. It is the expectation of the new management to bring the production of the rubber plant up as fast as practicable and ultimately to attain an output of from 800 to 1,000 tires per day, in addition to tubes. It is also hoped to establish, in time, a mechanical goods department, much of the equipment of the plant being available for that purpose as well as for the manufacture of tires and tubes.

Republic Branch in Tulsa

The Republic Rubber Co., Youngstown, Ohio, is closing its Kansas City branch and will open a distributing warehouse at Tulsa, Okla. Tulsa will become the Republic distributing center for the southwest.

Maderite Rubber Elections

The annual meeting of stockholders of The Maderite Rubber Products Company was held at the general offices and factory at 3962 East 93rd Street, Cleveland, Ohio, Saturday, February 2nd, 1924. The following Board of Directors was elected for the ensuing year:—R. W. John, Edmond B. Haserodt, John R. Watson, W. V. Sleek, E. J. Ernst, R. F. Manning and Walter Buskius.

The Board of Directors immediately re-elected the following officers:—R. W. John, President and General Manager; W. V. Sleek, Vice President and Director of Sales; R. F. Manning, 2nd Vice President and Director of Service; E. B. Haserodt, Secretary and Treasurer; E. J. Ernst, Factory Manager.

This Company is rapidly getting on a firm footing according to an announcement and the demands for its products increase daily. The production capacity is being increased as fast as possible to take care of this demand.

Magnum Acquires Stanwood Plant

The Magnum Rubber Products Corp., of Garfield, N. J., has recently purchased the plant formerly occupied by the Stanwood Rubber Co., in Elizabeth, N. J. The Magnum company some time ago took over the plant of the defunct Smith Tire & Rubber Company. It is planned to employ between 400 and 600 workers when the plant is put into operation in the near future.

STAR 1923 SALES OF $1,617,046 SHOW INCREASE OF 10%

Net sales of the Star Rubber Co. for 1923 showed an increase over the preceding year of approximately 10 per cent, Secretary J. W. Desseker announced on February 12, following the annual meeting of directors. Net sales for the year totaled $1,617,046, an increase of $102,-684.38 over 1922 sales.

Officers elected were: L. H. Firey, president; R. L. Robinson and W. A. Humphreys, vice presidents; J. W. Desseker, secretary and assistant treasurer; R. G. Shirk, treasurer and assistant secretary, and J. A. Christie, factory manager. Francis Seiberling, William A. Boesche, W. A. Humphreys, L. H. Firey, R. M. Robinson, J. A. Christie and J. W. Desseker were elected directors.

Denman-Myers Annual Meeting

At the annual meeting of the stockholders of the Denman-Myers Cord Tire Company held recently at the general offices of the company many stockholders from Ohio and Pennsylvania were present.

Due to the illness of Walter E. Myers, president, the meeting was opened by H. F. Webster, secretary. E. H. Peck presided as chairman of the meeting.

Nine members of the board of directors were re-elected while two new members were added: Directors who were re-elected included: Walter E. Myers, W. R. Denman, H. F. Webster, L. M. Harper, J. E. Morris, E. H. Peck, W. B. Prester, F. W. Stillwagon, F. C. Raymond, while Geo. C. Braden and P. R. Manahan are the new members elected.

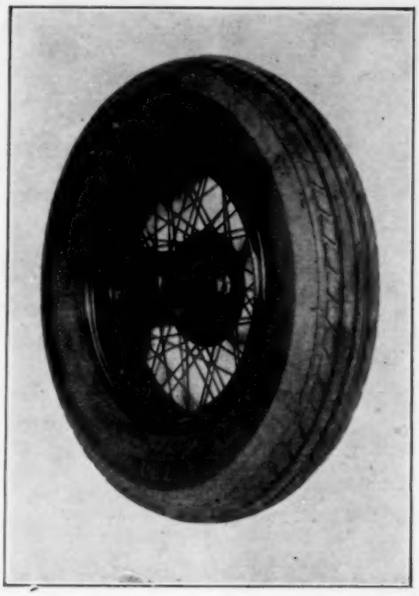
The meeting as a whole proved to be an open discussion on the progress and prospects of the Company. In the course of this general discussion those present learned that the Company has on file $100,000 in unfilled orders despite the fact that shipments made so far this month amount to more than 150 per cent over the business that was done during December.

Burdick Plant Reopens

After having been idle for a year, the factory of the Burdick Tire and Rubber Company, Noblesville, Ind., has resumed operation. Fifty to seventy-five men have been added to the pay roll and it is said that enough orders are booked to keep the plant in operation for six months. New machinery will be set. It is understood that the company has acquired financial backing in New York.

Lemon Talks on Latex Research

"Research in Improving, Handling and Utilizing Rubber Latex" was the subject recently discussed by Dr. B. J. Lemon, assistant technical director of the United States Rubber Company before members of the Engineers' Club of Passaic, N. J., at a recent meeting of that body. A. L. Freedlander, factory manager of the Dayton Rubber Manufacturing Company talked on "Tire Construction" with particular reference to the balloon tire.



NEW DUNLOP BALLOON

7.30 in. Size for 20 x 4 1-2 or 20 x 5 Rim Replacing a 4 1-2 or 5 in. Standard Tire

WANTS WAR ON WEEVIL

Edward E. Bartlett, Jr., President of the New York Cotton Exchange, has issued a statement in which he urges Congress to recognize the seriousness of the boll weevil menace and to take action to combat it.

"Taking advantage of the handicap under which the Southern planters are working, because of the spread of the boll weevil," Mr. Bartlett said, "other countries are making strenuous efforts to increase their cotton acreage, and some which heretofore never raised cotton are now attempting its cultivation. India, Brazil, Colombia, Ecuador, Manchuria and Turkey already are competitors of America, and it is possible that both Mexico and the Argentine may become so on a large scale.

"The boll weevil can be conquered. It is simply a question of education of the cotton farmer and the providing of means to finance a campaign on a large scale under a leadership that will direct the fight aggressively and effectively. A generous appropriation by the Government for this purpose will result in saving the American public millions of dollars annually and will preserve America's supremacy as the leading cotton-growing nation of the world."

DUNLOP ANNOUNCES BALLOONS MADE IN U. S.

Buffalo Plant Now Manufacturing Balloon Tires After Long Period of Experimentation—Tread Design Follows That of Dunlop Cords

The Dunlop Tire & Rubber Company, Buffalo, N. Y., is now in the field with balloon tires according to an announcement made recently by President Edward B. Germain.

Since 1916 Dunlop has been carrying on experiments with balloon tires at its plant in Birmingham, England. With this knowledge as a background, American engineers have perfected a balloon tire which gives greater cushioning and stability for all cars.

American Dunlop balloons have been experimented with over a long period fitted to Cadillacs run on the roughest roads possible, and in addition over the ice covered drives of Buffalo parks. At no time has there been the slightest tendency to "shimmy" or sway under high speed. Brakes applied while the car was being driven at fifty-five miles an hour over ice-surfaced roads brought the Cadillacs to a stop accompanied by a slight, gentle swerving of the rear end. The car immediately lined up in its proper road direction. At no time was there any skidding of the front wheels.

The Dunlop tread is composed of three ribs in the center and a row of oblong blocks (which follow the Dunlop non-skid pattern) on either side. These blocks are at an angle as they are on Dunlop's standard cord. Through numerous tests the ribs have proved to afford excellent control of the steering apparatus. Complicated designs on the tread of a balloon, engineers say, give considerable resistance to the driver, because, largely, the balloon's road surface is so much wider than it is on the standard pneumatic.

Excellent traction as well as high-non-skid is afforded by the oblong blocks on both sides of the triple-ribbed center. Tests through snow drifts have proved that the Dunlop balloon experiences no difficulty in getting out, even though the car is started from a dead standstill.

The Dunlop balloon has been designed to fit standard rim sections as adopted by the Rubber Associaton of America through suggestions from the Tire and Rim Association.

Fire at Buckeye Plant

A stubborn blaze on January 26 caused an estimated damage of $35,000 at the plant of the Buckeye Rubber Mnfg. Co., at Willoughby, Ohio. The fire is said to have been due to spontaneous combustion.

Miller 1923 Sales

A sales record of close to $30,000,000 for 1923 is expected to be announced soon by the Miller Rubber Co., Akron, Ohio. The actual figures, however, will not be announced until after the Annual Meeting of stockholders in March.

AUTO MAKERS DEMAND OTHER BALLOON SIZES

Despite Attempts of Rubber Association to Limit Number of Balloon Tire Sizes Automobile Manufacturers' Demands Force Issuance of List of Complete Sizes.

The rapidity with which automobile manufacturers are adopting balloon tire equipment has not permitted of extensive changes in wheel and rim sizes to conform to the standard sizes recently issued by the Rubber Association with the result that it has been found necessary for the Tire Executive Committee of the Association to issue a new list of balloon tire sizes to include all rim diameters and cross sections for which there is likely to be a demand by car manufacturers.

This change was made at a meeting held on Feb. 6 at which time the committee issued a new list of sizes and markings. This list is printed on this page in full. The announcement of the committee, as sent to the members of the Tire Manufacturers Division, was as follows:

It is the opinion of the Executive Committee that the automobile industry is in a period of transition with respect to the trend toward smaller diameter wheels. Many car manufacturers, because of material and equipment conditions, are unable to see their way clear to redesign present products so as to use only the balloon tire sizes that have been recommended as standard by the Tire Executive Committee. The Committee believes, however, that the question of balloon tire standardization gradually will work itself out in the direction of small diameter rims and a lesser number of cross sections for each tire size.

The Committee believes that the quickest way to effect balloon tire standardization is for tire manufacturers to cooperate fully with car manufacturers in their experimentations to solve their standardization problems. Consequently, the Tire Executive Committee concluded to distribute to all members of the Tire Manufacturers Division the attached list embracing all sizes of balloon tires in all rim diameters and cross sections for which there is likely to be a demand by car manufacturers, with the recommendation that the sizes and marking shown in the list be recognized as standard for the industry. The Executive Committee urgently recommends that tire manufacturers exert every effort to adhere to this line-up of sizes and the designated marking.

The marking shown in the list for balloon tires on existing standard rims indicates single oversize, but the Committee left optional with manufacturers the designation of double oversize tires.

The Tire Executive Committee also considered the question of whether a differentiation in marking should be made between low pressure tires for small diameter rims and those for use on existing standard rims. The Committee concluded to recommend that all low pressure, thin side wall tires be designated "Balloon" and left optional with tire manufacturers the use of additional words such as "Type," "Tire," "Cord," etc.

For New Rim Diameters

4.40/20
28 x 4.40
Fits 3½" rim—20" wheel
4.40/21
29 x 4.40
Fits 3½" rim—21" wheel
4.40/22
30 x 4.40
Fits 3½" rim—22" wheel
4.95/20
29 x 4.95
Fits 4" rim—20" wheel
4.95/22
31 x 4.95
Fits 4" rim—22" wheel
5.25/20
30 x 5.25
Fits 4" rim—20" wheel
5.25/21
31 x 5.25
Fits 4" rim—21" wheel
5.25/22
32 x 5.25
Fits 4" rim—22" wheel
5.77/20
30 x 5.77
Fits 4½" rim—20" wheel
5.77/21
31 x 5.77
Fits 4½" rim—21" wheel
5.77/22
32 x 5.77
Fits 4½" rim—22" wheel
6.20/20
32 x 6.20
Fits 4½" rim—20" wheel
6.20/21
33 x 6.20
Fits 4½" rim—21" wheel
6.60/21
33 x 6.60
Fits 5" rim—21" wheel
7.30/20
34 x 7.30
Fits 5" rim—20" wheel

For Existing Rim Diameters

31 x 4.40
Interchangeable with 30 x 3½ Tire
passenger cars only
32 x 4.95
Interchangeable with 31 x 4 Tire
passenger cars only
33 x 4.95
Interchangeable with 32 x 4 Tire
passenger cars only
34 x 4.95
Interchangeable with 33 x 4 Tire
passenger cars only
33 x 5.77
Interchangeable with 32 x 4½ Tire
passenger cars only
34 x 5.77
Interchangeable with 33 x 4½ Tire
passenger cars only
35 x 5.77
Interchangeable with 34 x 4½ Tire
passenger cars only
35 x 6.60
Interchangeable with 33 x 5 Tire
passenger cars only

BALLOON PRESSURE AND CAPACITY BEING CHANGED

The Tire Executive Committee of the Rubber Association at its meeting on Feb. 6 considered a schedule of load carrying capacities and inflation pressures for balloon tires, tentatively approved by the Tire & Rim Association of America, Inc.

The Committee did not believe the schedule as presented to be adequate and consequently referred it back to the Tire & Rim Association for further investigation and recommendation.

Pending approval of a revised schedule, the Tire Executive Committee recommends that all members of Tire Manufacturers Division inform their dealer organizations that the inflation pressure for balloon tires shall be considered as between 20 lb. as a minimum and 30 lb. as a maximum.

SOUTH AMERICA WILL STUDY OUR HIGHWAYS

Representatives of Latin America To Be Invited to United States This Summer to Learn What Our Highways and Transportation Have Taught Us.

WASHINGTON, February 17—Forty representatives from twenty Latin American countries will make an intensive field study of highways and highway transport in the United States early this summer as guests of the Highway Education Board, Dr. John J. Tigert, chairman, announced today.

Invitations to be sent the prospective delegates, who are to be of the highest standing in their respective countries, will go forward within the near future. They will, it is said, be the unofficial representatives of their governments. A minimum of one delegate from each country will be present, while two or three representatives will be sought from several of the larger republics, depending upon size, population, and other factors.

The countries from which representatives will be chosen include Argentine, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Salvador, Uruguay, and Venezuela.

J. Walter Drake, Assistant Secretary of the Department of Commerce, and Thomas H. MacDonald, Chief of the United States Bureau of Public Roads, Department of Agriculture, who, with Dr. Rowe, were originators of the plan, also will participate in the arrangements and survey. Dr. G. A. Sherwell, secretary general of the Inter-American High Commission, has agreed to give the benefit of his wide South American experience.

Purpose of Expedition

It is proposed to conduct the Pan American visitors, who are to be men of broad experience in highway affairs in their respective countries, on a survey of approximately three weeks' duration through several of the more progressive States of the Union so they may learn first-hand what our vast experience in highway building and in highway transport has taught the engineers and economists of this country.

Members of the Highway Education Board, under whose auspices the delegates will be brought to this country and the studies made, are Dr. Tigert, chairman; Thomas H. MacDonald, Chief of the United States Bureau of Public Roads, Department of Agriculture; Lieutenant Colonel Henry C. Jewett, Corps of Engineers, United States War Department; Roy D. Chapin, representing the automotive industry of the country; H. S. Firestone, representing the rubber group; F. L. Bishop, Dean of the School of Engineering in the University of Pittsburgh, representing engineering education, and B. B. Bachman, representing automotive engineering.

GRUBB WITH VICTOR AS VICE-PRESIDENT

Harry A. Grubb, who for eleven years has been a prominent figure in the tire industry, has just been elected Vice President, in charge of sales, of the Victor Rubber Company, Springfield, Ohio.

Mr. Grubb started in 1913 selling Firestone tires. His success was such that he was later given management of the Oldfield Tire Company, a Firestone subsidiary.

In 1922 Mr. Grubb resigned from Oldfield to take over the sales management of a smaller tire company and won a reputation as the developer of many successful ideas in merchandising tires.

H. A. Grubb

Footwear Factories Curtail Production

Lack of inclement weather this winter has caused a number of New England footwear factories to curtail production materially and to lay off a large number of workers. The Boston Rubber Shoe Company at Malden, Mass., recently announced a four-day week but did not find it necessary to lay off any men. It is said that about half of the present production is going into stock until better market conditions increase the demand.

At the plant of the Converse Rubber Shoe Co., Malden, Mass., a four-day week was announced effective with the last week in January and about 200 workers, mostly in the gaiter department, were laid off. At this plant it is said that almost all of the production is already going into the stockrooms whereas last year it was not until early in April that this was found necessary.

Hicks and McGovern Promoted

Herbert W. Hicks has been appointed Branch Manager for The Mason Tire & Rubber Co. at Jacksonville, Florida. For five years, Mr. Hicks has been Sales Promotion Manager at The Mason factory at Kent, Ohio, and had many years of previous experience in tire advertising and dealer co-operation with other leading tire companies.

J. L. McGovern has been made Branch Manager for The Mason Tire & Rubber Co. at Syracuse, N. Y. Mr. McGovern was recently District Manager for The Howe Rubber Co., and previously for many years was Branch Manager for Kelly-Springfield in Western New York.

Aguirre Joins Export Association

J. V. Aguirre, for the past five years Export Manager of the Mason Tire & Rubber Company, has resigned his position to join the Rubber Manufacturers' Export Association of Akron as Vice-President.

Mr. Aguirre sailed from New York on February 16th and will make an extended trip through the West Indies, Colombia and Venezuela, establishing connections for the members of the Association.

Thomas Production Satisfactory

General satisfaction was recently expressed by a number of Wooster business men to the Thomas Rubber Co., plant at Wooster, Ohio. The plant is employing about 80 workers with an average weekly pay roll of $2000. About 500 tires a day are being made according to report.

AKRON RIDING ON RUBBER

Akron has had a taste of bus and jitney transportation since February 1—and it has not taken kindly to it. Already attempts are being made to restore trolleys but the city administration seems intent on giving the newer means of transportation a thorough trial and is not looking kindly on the efforts of the Akron Chamber of Commerce to bring back the trolleys.

It all came about like this: The trolley people wanted to charge a 7 cent fare. The city thought 5 cents was enough. A compromise of 6 cents was offered but refused by Mayor Rybolt. As a result, the city accepted the offer of several hundred Ford cars made by Mr. Firestone, and with the addition of outside buses and the local jitneys, the new system of transportation was started on February 1.

Since that time a snow storm has hindered suitable transportation, fares have been excessive in a number of cases, service has been unsatisfactory and general dissatisfaction was expressed in various quarters. It seems likely, at this writing, that a compromise will be effected soon and that Akron will again be using the former means of transportation, that is, if the offer of the traction company to institute a six cent fare is not withdrawn.

PROPOSED SCRAP RUBBER RATES FROM SOUTH

The Scrap Rubber Division of the National Association of Waste Material Dealers has been endeavoring to have commodity rates on scrap rubber from Southern points to Northern and Eastern destinations published, and has received a statement covering tentative rates which the Southern roads believe should be made effective. These rates are on the basis of the commodity rates established from Southern points on scrap metals and the carriers state that they are of the opinion that, as scrap rubber has practically the same commercial and traffic characteristics as scrap metals, the basis is a proper one. Illustrations of the rates proposed are shown below:

	From		
To	Atlanta, Ga.	Charlotte, N. C.	Chattanooga, Tenn.
Boston, Mass.	65c	54c	65c
New York, N. Y.	61c	50c	61c
Philadelphia, Pa.	54½c	43½c	54½c
Baltimore, Md.	49c	38c	49c
Alexandria, Va., and Washington, D. C.	47c	36c	47c
Virginia Cities	38c	27c	38c
Cincinnati, Ohio	38c	42c	30c
Louisville, Ky.	38c	42c	30c
Evansville, Ind.	38c	47c	30c
St. Louis, Mo.	46c	54c	38c
Chicago, Ill.	50c	54c	44c
Cleveland and Akron, Ohio	50c	48c	43c
Lima, Ohio	48c	48c	41c
Buffalo, N. Y.	53c	47c	46c
Pittsburgh, Pa.	51c	45c	44c

Hyke With Buckeye Rubber

Announcement was recently made that C. E. Hyke, who has been Factory Superintendent and Sales Manager for about seventeen years at the Western Rubber Co., Goshen, Ind., has resigned to become factory manager for the Buckeye Rubber Mnfg. Co., at Willoughby, Ohio, manufacturers of a complete line of mechanical and molded rubber goods. Mr. Hyke will move his family to East Cleveland on April 1.

Goodrich Quits Hoboken for Brooklyn

It is reported that the B. F. Goodrich Co., will shortly move its Eastern warehouse from its present location in Hoboken, N. J., to the Bush Terminal in Brooklyn. A lease has been obtained on 90,000 sq. ft. in Bush Building No. 46 at a reputed rental of $50,000. It is expected that the change will be made on May 1.

Fire Destroys Virginia Plant

The tire factory of the Virginia Tire & Rubber Co., at St. Albans, W. Va., was recently destroyed by fire, with an estimated loss of $400,000, partially covered by insurance. For a long time after the organization of this company progress was unsatisfactory and it was later sold at a foreclosure sale. It was bought in by a syndicate headed by G. C. Hedrick who is now president. Other officers are: R. W. Louer, Vice-president; F. R. Talbott, Vice-president and General Manager; E. P. Stroman, Treasurer.

Chilean Trade In Soles and Heels

The following table showing Chilean imports of "soles and pieces of rubber for footwear" during 1922, shows the extent to which the United Kingdom leads in this branch of the rubber goods trade:

From—	Kilos	Pesos ($0.365)
Great Britain	2,202	14,048
Germany	325	958
United States	378	807
Czechoslovakia	161	310
Total	3,066	16,123

United States exports of rubber soles and heels to Chile have been as follows:

	Pounds	Value
1920	a	$2,275
1921	a	590
1922	3,126	1,604
*1923	1,848	700

*First ten months only.
aPounds not available in 1920 and 1921.

Chile is one of the few South American markets to which United States exporters are not making increased shipments of rubber heels and soles (principally heels) this year.

Tire Price Cutting in Mexico

The latest automobile census of Mexico shows that there are 20,856 passenger automobiles and 3,348 trucks in service in the Republic, of which 9,515 passenger automobiles and 1,264 trucks are in use in Mexico City and the surrounding district. This census, though not quite complete, is sufficiently so to indicate the extent of the market here.

Undoubtedly the tire market has been overdone in Mexico. Competition has been very keen and price cutting has been very common. Most of the well known American makes are established here, as well as the French Michelin, the German Continental and the English Dunlop, which is the latest competitor in this market. The Continental held a heavy trade for a time, due to its low cost, but it is said to have proven of very inferior quality. (During the first eight months of 1923, Germany exported only 2,016 casings to Mexico as compared with 2,378 in the corresponding period of 1922.) The Dunlop has yet to prove its success in this field.

Want Dates On Tires

Consul Charles J. Pisar, Capetown, So. Africa, reports that at a recent conference of the Automobile Clubs of South Africa a resolution was adopted calling upon the Government to introduce legislation compelling manufacturers to indelibly imprint upon all rubber tires and tubes the date of manufacture. This is to prevent the shipping of old stocks and to insure that the South African market is supplied with fresh tires.

Firestone Opens Butte Warehouse

The Firestone Tire and Rubber Company has opened a new warehouse in Butte, Montana, under the management of C. A. Marrs. In addition to a complete line of tires to be carried a line of rims of all sizes will be a part of the stock.

NATION'S TIRE BILL ABOUT $450,000,000

Potential savings in automobile operation, maintenance and depreciation costs are important in demonstrating the earning capacity of highways, according to Secretary Wallace of the Department of Agriculture. The Secretary estimates that the annual fuel bill of motor vehicles in this country is $1,000,000,000, while the annual tire bill is $450,000,000. It is possible to figure the annual depreciation on an estimated investment of $8,767,500,000 in automobiles.

These figures, while estimates, are a reasonable indication of the magnitude of the financial side of our motor transport equipment, states Secretary Wallace, and it is evident that the operating cost will be affected materially by the general improvement of the nation's highways.

WORLD'S RUBBER NEEDS

The numbers prefixed to the trade opportunities listed below refer to confidential information regarding the particular inquiries. To obtain the confidential information it is necessary only for American exporters to apply to the nearest office of the Bureau of Foreign and Domestic Commerce giving the number or numbers of the inquiry or inquiries in which they are interested.

A full list of inquiries, divided into those who wish to purchase and those who wish to act as agents, is as follows, an asterisk (*) indicating that the inquirer would act in both capacities:

Austria—
8564 Tires, auto. (agent)
8569 Tires, auto. 2,000 to 3,000 first quality. (agent)

France—
8718 Boots, rubber. (purchaser)

Spain—
*8754 Sporting goods, including footballs, hockey balls, and golf balls.

Akron As Future Air Center

Akron has better possibilities for becoming the center of air traffic between New York and California than any other city in the United States, according to a statement made by William B. Stout, a Detroit inventor, to members of the Akron Rotary Club.

Stout gave three reasons why Akron is best suited in this respect: First, because plans of the Goodyear Rubber Company, in which Akron will become the center for manufacture of dirigibles in this country. Second, because the city is in such a location that it is the logical subdivision of coast-to-coast air traffic, and third, because Cleveland, the nearest competitor for the distinction, being a larger city, would be less apt to come to an agreement for establishing an air center there.

Russian Rubber Industry

According to the Moscow *Pravda* of July 24, 1923, the number of persons employed in the three main rubber factories (Treugolnik, Bogatyr, and Kautchuk) was estimated at 11,700 in November 1922, 12,633 in January 1923, and 10,500 on May 1, 1923. During the eight months period, October, 1922 to May, 1923 inclusive, 7,508,100 pairs of rubbers, 377,400 tires and tubes, 22,334 poods of belting and hose, and 564,000 square arshines of rubber cloth are said to have been produced. April and May show a considerable decrease in production due to the diminished working force. Comparison of production in the period October-February 1921-1922 with that of October-February 1922-1923 shows that the latter exceeds the former three times as to its value in pre-war roubles. On May 21 the Bogatyr factory was closed for repairs and two weeks leave of absence was granted to employes. The rubber shoe division of the Treugolnik factory has also stopped production temporarily. The production of tires and tubes is being increased. During the current year the Rubber Trust expects to export 2,000,000 pairs of rubbers and to import about 400,000 poods of crude rubber; cloth, yarn, and cotton worth 3,300,000 gold roubles; and chemicals worth 1,250,000 gold roubles.

French-Italian Rubber Merger

According to *L'Exportateur Francais* of Oct. 25, 1923, La Campagnie Francais du Caoutchouc capitalized at 10,000,000 francs, which has factories at Thiant and Halluin in the Nord, and which specializes in the manufacture of a cushion tire for trucks known as the Automatique Ducasble, has perfected an agreement with the Italian S.A.L.G.A. of Turin, capitalized at 10,000,000 lire, by terms of which it will gain control of the Italian firm. The principal products of the latter are rubber thread, proofed goods, and rubber toys. The factory will hereafter produce pneumatic tires and truck tires for the Italian and Near Eastern markets. The cushion tire for trucks is reported to have an increasing use in France, it is said to have been satisfactorily tried out by the London General Omnibus Company, which has some 4,000 vehicles in use in London, and it is worthy of note that in Belgium, where solid tires are subject to a heavy tax on account of their destructive effects on roads, this tire was decided to be in the pneumatic tire class.

Motor Registration in U. K.

The total number of motor vehicles registered up to May 31, 1923, was 978,000, or 153,000 more than on May 31, 1922. The motor cars numbered 346,000, an increase of 70,000; motor cycles numbered 387,000, an increase of 51,000; commercial goods vehicles 166,000, an increase of 21,000; and commercial motor passenger vehicles 79,000, an increase of 4,400.

Balloon and Balloon-Type Tire Market Increasing Rapidly

Manufacturers Are Announcing New Sizes and Production Schedules Indicating Wide Spread Interest on Part of Dealers and Car Owners

EVERYBODY'S doing it ! Balloon tires are on the tongue of nearly every tire manufacturer, car manufacturer, tire dealer and motorist in the country. Seldom has any item of manufacture in the rubber industry taken hold of the imagination of the entire trade as has the balloon tire.

Fanned to a fever heat by the wonderful reception given balloons at the recent automobile shows, every tire manufacturer of any size immediately set to work and rushed to completion any plans which had been tentatively made to manufacture balloon tires. At first they were considered novelties—something pleasing to look at, to contemplate but not to be considered seriously. Four wheel brakes had the limelight. These brakes were to revolutionize the automobile. Gradually, however, it became apparent that the balloon tire solved the same problem as four-wheel brakes by affording better traction than was ever obtained by the best of the non-skid tires. No structural change or new design was needed for the balloons—new wheels sizes was all that was necessary. The result was that many car manufacturers, who had not designed four wheel brakes, took hold of the balloon tire idea and pushed it for all it was worth. The National Automobile Show held in New York recently gave the riding public its first real glimpse of the tire—and to see was to want.

Large Number of Balloons Announced

The scramble to get aboard the "Balloon Special" in the shortest time possible soon resulted in many announcements in the newspapers and the trade press by a large number of tire manufacturers. Firestone, Fisk, Goodyear, United States, Cord Tire Corp., Miller, Seiberling, Goodrich, Vogue, Dunlop, General and a number of others have announced that they are manufacturing either the regular balloon tire requiring both rim and wheel changeover or the balloon-type tire which fits present rims. Some, of course, are manufacturing both types.

In a full page advertisement in the daily press, Goodyear, on February 10 came out with its announcement of balloon tires to fit present rims. It stated that it had developed the new tire for those car owners who did not want to make wheel and rims changes and that it offered "the full advantages of balloon tires in buoyancy, cushioning and comfort at the very minimum of cost." A coupon was included in the advertisement for those who wanted more detailed information on the whole subject of balloons.

A Boon to Makers and Dealers

The result of all this publicity has been an interest which is being capitalized by the progressive tire manufacturer and dealer. The year did not start out as promising as the trade had expected. What more welcome, then, than the advent of a new idea in tires which not only took hold of the buying public by its newness, but an idea which in a comparatively short time really proved its worth. The tire industry—both manufacturing and retail—is now looking for the best year it has ever experienced.

Dealers everywhere are seeking information of every sort on balloon tires. Customers are coming in with such a myriad of questions that the dealer is hard pressed to keep his customers satisfied. A number of manufacturers had anticipated this condition and supplied its dealers with booklets, circulars and letters which answered many of the questions brought in to the dealer. In a large newspaper advertisement on January 22, The General Tire and Rubber Company announced that certain of its dealers were in a position to answer questions on balloon tires. The advertisement was headed "Balloon Tires—Headquarters for Information." A list of questions followed so as to indicate the kind of information which the dealers (listed at the bottom of the advertisement) were able to answer. The list is as follows:

What size Balloon tires does my car require ?
Will I have to change my wheels and rims ?
Are there any Balloon tires made that will fit my present wheels without necessitating a change ?
What air pressure for Balloon tires for my car ?
Will Balloon tires interfere with the power ?
Will they consume more gasoline,
Are shock absorbers required ?
What mileage will Balloon tires give ?
What about skidding and steering ?
What other benefits besides passenger comfort and car life ?
How does the price compare with regular size tires ?

Such a service is of course necessary and greatly advisable at this stage in the introduction of balloon tires. Much harm can be done at the start and no manufacturer should fail to keep his dealers fully posted on all the latest developments on this subject in order that the buying public may have the proper introduction to and knowledge of this latest aid to riding comfort, secure traction and lower car upkeep.

In addition to the instance cited above, other manufacturers have sent a mass of material to their dealers so as to keep them posted on balloons. Two of the latest bulletins of this kind are from the Miller Rubber Company and the Seiberling Rubber Company, both of Akron, Ohio. The Miller information is contained in the latest issue of its *Tire Trade News*, the February issue. Not only does it announce the new Miller Balloon type cord tire which is interchangeable with the regular 30 x 3½" tire, but it also gives the proper loads and inflation for balloon type cords for the Ford, Chevrolet, Star and Overland cars in various models. In addition it illustrates the appearance of the balloons on several of the above cars and also gives to the dealer a series of sample letters which can be sent out to customers informing of this latest development in tiredom.

THE SEIBERLING POLICY

(As Announced to its Dealers)

The question may be raised in the minds of Seiberling dealers in connection with the announcement made herein—as to the relationship between the sale of regular size tires and the Balloon or Interchangeable Balloon types in 1924.

The bulk of your sales will be on regular tires. The sale of balloon types will only be supplementary.

Your chance for volume is on regular tires. Do not allow your interest in balloon tires to blind you to the fact that your volume and your profits for 1924 will come from the sale of regular size tires.

Probably the procedure will be somewhat as follows—

1.—Customer will inquire regarding balloon tires. Price of changeover will be too high to warrant the change.

2.—In most cases, customer will decide to keep his original equipment.

3.—In some cases, customer will still stick to balloon tire idea—but will purchase Interchangeable Balloon Tire type.

In the Seiberling News, the dealer organ of the Seiberling Rubber Company, a note of conservatism is shown and a warning issued to dealers advising them to proceed carefully with their recommendations and sales of balloon tires. The box on the opposite page gives the wording of this warning and is reproduced here so as to show the attitude of one manufacturer on the promiscuous change-over from cords to balloons.

Seiberling Making Both Types

Seiberling continues by stating that in addition to the interchangeable balloons it is also making the regular balloon tire in all the sizes requiring special rims and special wheels. The dealer, therefore, who has convinced his customer that he wants the full sized balloon tire, must also sell him new wheels and rims. For the purpose the dealer is supplied with a list of wheel manufacturers who are in a position to supply the new wheel, with a list of the prices charged by each wheel manufacturer. In this way, the Seiberling dealer can either recommend the semi-balloon "interchangeable" tire for which no wheel change is necessary or he can sell the regular balloon and suggest the proper size and correct price for the new wheels and rims which will be required.

The sizes of the Seiberling interchangeable balloons are as follows:

Size Tire Replaced	*Size Interchangeable Balloon*
30x3½	31x4.40
31x4	32x4.95
31x4	33x5.77
32x4½	33x5.77
32x4	34x5.77
33x4½	34x5.77

The Seiberling balloon tire sizes are given in the accompanying chart:

Standard Size Tire To Be Replaced		*Balloon Tire Size*	
30x3½	4.40 for	21x3½	29x4.40
31x4	5.25 for	21x4	31x5.25
32x4	5.77 for	21x4½	31x5.77
33x4	5.77 for	21x4½	31x5.77
32x4½	6.20 for	20x4½	32x6.20
33x4½	6.20 for	20x4½	32x6.20
34x4½	6.20 for	20x4½	32x6.20
33x5	7.30 for	20x5	34x7.30
35x5	7.30 for	20x5	34x7.30

(Note that the second and third columns show two ways of specifying a balloon tire size. The industry has not developed either method of size-description yet as standard.)

The industry has attempted to cover so much in such a short time that there undoubtedly exists much doubt in the mind of many possible users of balloon tires as to their actual value. Enough time has not passed since the advent of balloon tires to be able to collect in any systematic way, complete data on all phases of the situation, nor has there been enough time for the new sizes recommended by the Rubber Association to be put into effect. It was interesting to note therefore the advertisement by Goodrich in the newspapers of February 10, headed "Plain Facts on Balloon Cords." This announcement recounted the story of the balloon tire and is especially valuable at this time in helping to bring order out of chaos. It is therefore reproduced here in full in order that it may be read by those in the industry who failed to see it at the time it was published. The Goodrich Company is to be congratulated on this forward step, which is of inestimable value to the industry as a whole, and it is hoped that the Rubber Association may continue the good work thus started by initiating an advertising campaign along similar lines.

PLAIN FACTS ON BALLOON CORDS

BALLOON Cords need a clear, frank presentation to the public.

The apparent novelty and promise of these tires have caught the imagination of close followers of the motor car.

Many are doubtless wondering how they will affect their cars and are confused regarding the two distinct types of balloon cords that are being advertised.

Among tire makers and car makers the position of the balloon cord is well understood.

The three principles underlying it—oversize, light flexible body, and low pressure inflation—have long been known to tire manufacturers, and employed by them.

Oversizing is an old story in standard size tires.

The essential difference between standard and balloon cords is lower air pressure, and lighter body construction.

Where the standard cord carries from 60 to 65 pounds air pressure, sometimes higher, the balloon cord is inflated at from 20 to 40 pounds. In fact, they must always carry these low pressures to function with safety.

Where the number of plies in a large size standard cord is six or eight, the balloon cord has but four.

The principle of the balloon cord tire is this:

Generally speaking, that portion of the tread which rests on the road (the contact area) expressed in square inches, will if multiplied by the pounds of air pressure inside the tire, give approximately the weight of the load the tire is carrying.

Following out this principle, if a 1000 pound load is to be carried on a regular standard cord, and only 20 square inches of contact with the ground is obtainable on account of the limit of the "give" (vertical deflection) of the tire, an air pressure of 50 pounds per square inch is needed to carry the load.

On the other hand, if the area of road contact can be increased without exceeding the proper degree of vertical deflection, much less air pressure is required inside the tire.

For instance, if the area of road contact is increased from 20 to 40 square inches, an air pressure of 25 pounds to the square inch will carry the 1000 pound load.

On account of greater sectional diameter, and more "give" in the tire, the balloon cord provides a greater area of road contact than the standard cord, hence it can carry the same load with less air pressure to the square inch inside the tire.

Thus a comparison of the balloon cord and standard cord resolves itself to a question of low-air pressure, or high-air pressure.

Each has well known virtues. Tire engineers have always realized the advantage of lower air pressure.

And much may be said for the low-air pressure, or balloon cord.

On account of its broad contact with the road, its flexibility, and low air pressure, it can conform readily to irregularities in the road—absorb bumps so to speak.

To ride smoothly over ruts, holes, projections, and bad stretches of road at an even speed without jolting and jarring is a pleasing picture to contemplate, and balloon cords make this possible to a definite degree.

The life of a car is greatly prolonged because of the reduced shocks and jars to the chassis.

The large area of road contact also gives balloon cords anti-skid, traction, and breaking power—features which are truly outstanding.

Where a luxurious comfort and special service are wanted, balloon cords are a sensible and compensating addition to a motor car.

Goodrich manufactures balloon cords in two types—those requiring wheel and rim changes, and those that are interchangeable with the present regular equipment.

Motorists who have cars equipped with standard tires, and who want the added advantages of low pressure tires, can purchase Goodrich balloon cords, and have no added expense except the new tires themselves.

The function of Goodrich has always been to supply tires to meet the needs of transportation, the newest needs as well as the old.

THE B. F. GOODRICH RUBBER COMPANY

Copy of Advertisement which Appeared in Daily Papers on February 10.

Some New Vulcanization Accelerators

An Investigation of the New Vulcanization Accelerator Phenylbiguanidine and the Action of the Guanidine Compounds — Mechanism of Action Not Explained

By **Dr. Egidio Romani**

IT is common knowledge that Twiss in 1916 patented the salt, bicarbonate of aminoguanidine as an accelerator of vulcanization and that King, likewise in 1916, recommended the use of guanidine for the same purpose. Later Kratz and others demonstrated that the phenylated derivatives of guanidine possess accelerating power of a higher order than guanidine itself. Of these materials diphenylguanidine in particular found considerable industrial use, for it possesses vulcanization accelerating properties which are far more advantageous than many other accelerators. This fact has been the impetus to many chemical researches and investigations which have been instituted for the purpose of arriving at the explanation of the mechanism of the accelerating action.

In 1919 Dubose made the first experiments with biguanidine from the standpoint of its accelerating powers. In an analogous manner it was thought advisable that the phenylated derivatives of this compound could be used as accelerators.

Furthermore Scott also mentioned tetraphenylguanidine, which was made by the Bayer Co., as an accelerator of vulcanization. This substance was put on the market under the name of "vulcacite 1000." This is nothing more than a phenylated derivative of Dubose's biguanidine.

The Subject of this Investigation

In this investigation the author has dealt with several salts of a phenylated derivative of biguanidine and more particularly with the new chemical substance, phenylbiguanidine. He has also been concerned with establishing the mechanism of the accelerating action of the guanidine compounds.

The first of these phenylated derivatives that came up for consideration was the carbonate salt of alpha phenylbiguanidine. This salt has the following composition:

$$[(NH)\ (NH_2)\ C\ (NH)\ C\ (NH)\ (NHC_6H_5)]_2\ H_2\ CO_3.$$

This substance which has been isolated and studied as far as its accelerating action is concerned by the author's colleague, Dr. Benelli, can be easily obtained, starting with a solution of the free base alpha phenylbiguanidine which has been freshly prepared and which contains a considerable percentage of the base. The solution is then saturated with carbonic acid gas.

A more simple way of obtaining this substance is to add a hot concentrated solution of alpha phenylbiguanidine into an equimolecular concentrated solution of carbonate of ammonia. Ammonia is thereby set free and when the solution is cooled there is deposited a fine, crystalline substance, which is odorless and colorless. It is slightly soluble in cold water, but is very soluble in hot water. The melting point of the substance is 128 to 130 degrees C.

The substance is a very powerful accelerant of vulcanization and its properties in this respect are very analagous to those of diphenylguanidine.

Alpha Diphenylbiguanidine Urea

The formula of this compound is

$$(NH_2)\ C : O\ .\ NH\ .\ R,$$

in which R represents the alpha phenylguanidine radicle.

This substance is obtained by boiling an aqueous solution of urea with the proper proportion of alpha phenylbiguanidine. Ammonia gas is evolved and after several hours, the solution is allowed to cool off. Colorless crystals are deposited which may then be purified by recrystallization from water. The melting point of the substance is 216 to 218 degrees C. Its accelerating power is somewhat less than that of the carbonate salt which was described above.

Alpha Phenylbiguanidine Sulphydrate

This compound possesses the following formula:

$$[(NH_2)\ .\ (NH) : C\ .\ NH\ .\ C : (NH)\ .\ (NH\ .\ C_6H_5)]\ H_2S.$$

This substance is obtained by the action of sulphuretted hydrogen on a concentrated solution of alpha phenylbiguanidine, or still better, by the action of an aqueous solution of alpha phenylbiguanidine in the cold on a proportionate quantity of ammonium sulphydrate. After the solution has been permitted to remain standing for some time, a crystalline substance, white in color, is obtained which can be purified by recrystallization from water. The substance loses its H_2S content slowly on exposure to the air and more rapidly at an elevated temperature and is thus changed into the sulphide of alpha phenylbiguanidine, which possesses the following formula:

$$[(NH)\ (NH_2)\ :\ C\ (NH)\ C\ :\ (NH_2)\ (NH\ .\ C_6H_5)]\ .\ H_2S.$$

This substance is crystalline and is soluble in hot water. The color is a weak yellow and the melting point is 155 degrees C.

Both the sulphydrate and the sulphide are salts which are not as powerful accelerators as the carbonate.

Alpha Phenylbiguanidine Polysulphide

This substance has the following fomula:

$$[(NH)\ (NH_2)\ :\ C\ (NH)\ C\ :\ (NH)\ (NH\ .\ C_6H_5)]\ H_2S\ .\ S.$$

It is obtained by boiling a solution of the sulphydrate with sulphur, or more simply by the action in the cold of an aqueous solution of alpha phenylbiguanidine on the proper quantity of ammonium polysulphide $(NH_4)_2S_2$. It is a crystalline substance, very stable and after it has been purified by recrystallization from water, it has a yellowish tinge. It is insoluble in carbon bisulphide. The mineral acids attack it with the evolution of sulphuretted hydrogen and sulphur is also set free. It has a melting point of from 209 to 210 degrees C. As a vulcanization accelerator it is not as powerful as the carbonate salt.

Alpha Phenylbiguanidine Sulphocyanide

The formula for this salt is as follows:

$$[(NH_2)\ .\ (NH) : C\ .\ (NH)\ .\ C : (NH)\ .\ (NH\ .\ C_6H_5)]\ .\ HCNS.$$

It is obtained by heating an aqueous solution of ammonium sulphocyanide with the proportionate amount of alpha phenylbiguanidine to a temperature of 125 degrees C. During the process ammonia gas is set free. The substance is crystalline in structure, white, and possesses a pearly lustre after it has been purified by recrystallization from water. Its melting point is 232 degrees C. It is not as strong a vulcanization accelerator as the carbonate.

Mono Alpha Phenylbiguanidine Thiourea

The formula for this substance is as follows:

$$S : C\ .\ (NH_2)\ .\ (NH\ .\ R).$$

(R is the alpha phenylbiguanidine radicle).

The compound is formed by heating an aqeuous solution of thiourea mixed with the corresponding quantity of alpha phenylbiguanidine to a temperature of 125 degrees C. Ammonia gas is liberated during the process and a white,

Le Caoutchouc et la Gutta Percha.

crystalline substance is produced, which, after purification by recrystallization from water melts at a temperature of 142 to 143 degrees C. As a vulcanization accelerator it is superior to the sulphocyanide but inferior to the carbonate.

Alpha Ethyl Beta Alpha Phenylbiguanidine Thiourea

The formula for this substance is as follows:

$$S : C . (NH . C_2H_5) . (NH . R).$$

(R is the alpha phenylbiguanidine radicle).

The salt is obtained by the action of ethyl isosulphocyanate in the cold on a saturated solution of the ethereal derivative of alpha phenylbiguanidine. A white crystalline substance, which melts at a temperature of 246 degrees C, is obtaind. The accelerating powers of this compound are greater than those of the mono-alpha-phenylbiguanidine thiourea but slightly less than that of the carbonate.

Alpha Phenyl Beta Alpha Phenylbiguanidine Thiourea

This substance has the following formula, in which R is again the alpha phenylbiguanidine radicle:

$$S : C . (NH . C_6H_5) . (NH . R).$$

It is obtained by permitting a mixture of phenylsulphocyanide and alpha phenylbiguanidine in benzene to remain for several days. The salt is purified from water and is white in color and crystalline. As a vulcanization accelerator it is much less potent than the carbonate.

Alpha Phenylbiguanidine Dithiophenylcarbazinate

This salt has the following formula:

$$(NH) (NH\ C_6H_5)\ C : (S) (SH)$$
$$[(NH_2) (NH) : C (NH) C : (NH) (NH\ C_6H_5)].$$

It is obtained by the action of an aqueous solution of ammonium dithiophenylcarbazinate on an equivalent quantity of alpha phenylbiguanidine. A crystalline substance is precipitated which after it has been purified by recrystallization from water possesses a melting point of 142 degrees C. It accelerates the vulcanization of rubber but not to such a degree as the carbonate. With oxide of zinc it gives the rubber compound a somber red color.

Alpha Phenylbiguanidine Piperidyl Thiocarbamate

The formula of this complicated compound is as follows:

$$(C_5H_{11}) : (N)\ C : (S)\ SH$$
$$[(NH_2) (NH) : C (NH) C : (NH) (NH\ C_6H_5)]$$

It is obtained by boiling a solution of piperidyl dithiocarbamate of piperidinium with an equivalent quantity of alpha phenylbiguanidine. Piperidine is set free during the courses of the reaction, and after the solution has been cooled, a viscous substance separates out and when allowed to remain for some time it solidifies. This compound is slightly soluble in cold water and melts at a temperature of 94 to 95 degrees C.

The accelerating action of this substance is far more powerful than that of the carbonate, but less than that of piperidyl dithiocarbamate of piperidinium.

The phenyldithiocarbamate was also prepared but this compound was found to possess far less potent accelerating powers than the carbonate. Similarly the ethylxanthogenate was made, but this was also found to be less potent as an accelerator than the carbonate.

Alpha Phenylbiguanidine Dithiopyromucate

This important derivative of alpha phenylbiguanidine has the following formula:

$$NH\ C_6H_3 . C : (C) (SH)$$
$$[(NH_2) (NH) : C . NH . C : NH (NH\ C_6H_5)]$$

The compound can be easily prepared and with a very high yield by treating ammonium pyromucate with alpha phenylbiguanidine. The former compound was discovered by the author.

A calculated quantity of ammonium sulphide $(NH_4)_2S_3$ is treated with an equivalent quantity of furfurol. The reacting mass is left for twenty-four hours. A tarry substance then separates and this is mixed with one-third of the equivalent of an aqueous solution of alpha phenylbiguanidine. An abundant precipitate of garnet red crystals is formed, which are then purified by recrystallization from water. The melting point is 158 degrees C.

The accelerating action of this substance is much greater than that of the carbonate. The vulcanization process takes place at a greater speed and the temperature at which it is accomplished is also lower than that which must be employed when the carbonate derivative is used as an accelerator.

Alpha Phenyldiguanidine Benzomercaptol Thiazolate

The formula for this complicated derivative of diguanidine is as follows:

$$(C_6H_4) : (N) (S) : CSH$$
$$[(NH_2)_2 (NH) : C . NH . C: (NH) (NH\ C_6H_5)]$$

It is obtained by dissolving benzomercaptholithiazol in ammonia liquor and then adding this solution to a corresponding proportion of alpha phenylbiguanidine dissolved in water. In this way a yellow crystalline substance is obtained which dissolves in water and which melts at a temperature of 160 degrees C.

The accelerating properties of this substance is much greater than those of the carbonate derivative, which must be used at a higher vulcanizing temperature than the former.

General Remarks Regarding These Compounds

All these compounds are chemically new. The author in his investigations limited himself to coupling radicles with the base that were found in the majority of rubber accelerators. It is evident that many other derivatives can be obtained by the use of other radicles.

The conclusions which may be derived from the investigation are as follows:

1. Alpha phenylbiguanidine is a strongly basic substance. It gives stable salts with weak acids. It almost always displaces ammonia from its salts and sets it free as a gas and often does the same thing with soda and potash when the reaction is carried out at the boiling temperature.

2. The accelerating properties of the sulphydrate, the sulphide. the polysulphide are quite inferior to those of the carbonate.

3. The derivatives of thiourea are substances whose activity depends on the nature of the radicle in the alpha position. The thiourea which contains the ethyl group in this position is more active than the derivative which contains the simple hydrogen radicle in that position. This is the reason why alphamonophenylbiguanidine thiourea is more active than alpha phenyl bete-alpha phenylbiguanidine thiourea, and in every case, the accelerating power of these thioureas is always less than that of the carbonate. The sulphocyanate of alpha phenylbiguanidine is also inferior to the carbonate in accelerating power. It is therefore evident that the accelerating power of the compound is not due to the intermediate formation of thiourea.

4. As far as the dithiocarbamates are concerned, the various products which were described above and studied by the author in regard to their action on the vulcanization process indicated that only those compounds which contained the piperidine radicle with the trivalent nitrogen atom (and this certainly applied to the aliphatic amines) have superior accelerating power to the carbonate derivative, while those which contain aromatic radicles are still less strong.

5. While the accelerating power of alpha phenylbiguanidine is superior to that of the sulphuretted compounds formed with the same bases, namely the sulphides, thiourea, dithiocarbamates and those which may be formed during the progress of the vulcanization process, the mercaptobenzothiazolate derivative possesses accelerating powers which are much greater than those of the carbonate. This is contrary to the results that are obtained with derivatives of other dithio acids. This salt at a temperature of 145 degrees C, at which temperature all the experiments were carried out, always in the presence of zinc oxide in the rubber batch, has the same accelerating power as an equal weight of the free acid, mercaptolbenzothiazol. This does not constitute decisive proof of the formation during the vulcanization process of mercaptobenzothiazol and analagous products, when starting when phenylated guanidines, as some have thought.

The mechanism of the accelerating action of the guanidine type of accelerators has not yet been clearly explained.

Our Export Rubber Markets in 1923

Foreign Trade Situation Analyzed by Commerce Department
Growing Importance of Rubber Business Other than Tires

THE total value of exports of rubber goods from the United States in 1923 was $36,972,170, a gain of $2,962,862 over the 1922 value. This result is the more remarkable because of the lower 1923 unit values in practically every line of products, says E. G. Holt, of the Rubber Division of the Department of Commerce in an analysis of our foreign rubber markets. Exports of tires and tire sundries decreased in value from $20,702,982 in 1922 to $20,320,753 in 1923, in spite of heavier unit shipments of each of the seven classes of products reported in the group. There was however, a decided and striking increase in the exports of solid tires for automobiles.

Tire Export Trade Growing More Difficult

Comparison of the rubber goods exports from the United States during the past two years, will indicate the growing importance of exports of rubber products other than tires. An increasing share of the tire exports of American firms are shipped from Canadian branch factories and as a result the value of Canadian tire exports increased from $4,459,262 in 1922 to $6,330,486 in 1923, or 41.9 per cent. However, American competition in the tire trade is becoming increasingly difficult, chiefly because of higher labor costs in America than in France and Italy, and partly because of increases in tariff protection secured by manufacturers in other important markets. The tire manufacturing concerns of the world have an over-capacity for tire production, which is another factor contributing to the difficulty in this line of trade at present. The market for tires is not capable of expansion through increased sales effort, but has a very definite relation to the number of automobiles in use throughout the world.

Trade Outlook Bright for Other Lines Than Tires

In the sundries and specialties and footwear trades, however, there is a good possibility of increasing sales and consumption of rubber goods throughout the world. Even in markets where the standard of living is low the public is coming to use more and more these classes of rubber products. American genius in invention and skill in manufacture of quality products, coupled with an ever-growing domestic demand for rubber specialties, have given the United States acknowledged supremacy in the production of a wide range of rubber household and bathing goods, and druggists' rubber sundries.

The export of footwear, mechanical rubber goods, and specialties and technical rubber goods increased very considerably in 1923. There were 5,269,666 pairs of rubber boots and shoes exported last year, compared with 4,083,105 pairs the year before, and 1,903,502 pounds of rubber soles and heels, compared with 1,734,396. Of the footwear exports in 1923, 3,791,018 pairs were canvas rubber soled shoes, the principal markets being Argentine, the Philippine Islands, Cuba, Mexico, and England. It is worthy of note that exports of rubber footwear from the United Kingdom, France, Canada, and Sweden, were also increased in 1923, compared with 1922, indicating a growing use of rubber footwear.

Exports of rubber belting increased from 2,590,057 pounds in 1922 to 3,548,468 in 1923, rubber hose from 3,381,210 pounds to 4,455,502 pounds, and rubber packing from 1,149,446 pounds to 1,903,502 pounds. During 1923, the United States surpassed the United Kingdom in the volume of export sales of rubber belting for the first time.

Growing Exports of Scrap and Reclaimed Rubber

Exports of scrap and old rubber, and reclaimed rubber, were aided by the higher prices of crude rubber during the year; Canada, Spain, Germany, France and Japan each took more than a million pounds of scrap rubber; England, Scotland, Belgium, Holland, and Sweden being other important markets. Canada was the outstanding market for reclaimed rubber, shipments to Canada probably being largely for the use of branch factories of United States firms, but England, Sweden, Japan, and France likewise came in for fair amounts. There would seem to be room for much development in this trade in the future, although the conservatism of European manufacturers of rubber goods makes them slow to adopt products of American reclaimers, while the operation of reclaiming plants in many of these countries makes competition difficult. Continued efforts along this line should, however, be productive of increased trade.

American reclaimers might well make a special endeavor to establish contacts with recently organized rubber manufacturing companies, which are springing up in many countries. Reclaimed and scrap rubber were the only classes of rubber goods exports which had a higher unit value in 1923 than in 1922.

Exports of Thread and Drug Sundries

Exports of rubber thread and druggists' rubber sundries declined in 1923 both in quantity and value. French, German, and British competition in the druggists' rubber sundries trade was increasingly severe during 1923. The dull trade in rubber thread in the last half of 1923 reflected the elastic webbing trade depression in England, France, Italy, and Japan, which are the leading markets for rubber thread.

Trade in Hard Rubber Goods Satisfactory

The 1923 trade in the various classes of hard rubber goods was somewhat larger in volume than in 1922; there being a marked increase in exports of electrical hard rubber goods, other than battery jars and accessories. The value of hard rubber goods exported increased from $608,221 in 1922 to $646,646 in 1923. Most of the products exported under the caption of "other hard rubber goods" are for use in further manufacture, such as hard rubber sheets, rods, and tubes, handle stock, fountain pen stock, etc. Total exports follow:

		1922		1923	
		Quantity	*Value*	*Quantity*	*Value*
Rubber, reclaimed	Pounds	2,274,424	$216,257	4,508,490	$469,193
Rubber scrap, and old	"	8,383,752	340,541	13,805,833	619,697
Rubber footwear					
Boots	Pairs	241,919	630,549	395,023	947,536
Shoes	"	863,559	751,486	1,083,625	903,379
Canvas shoes with rubber soles	"	2,977,627	2,358,463	3,791,018	2,920,412
Druggists' rubber sundries	Pounds	795,793	871,465	787,590	774,443
Hard-rubber goods					
Battery jars and accessories	"	425,849	133,796	425,007	127,048
Other electrical supplies	"	193,734	87,432	306,242	103,358
Other hard rubber goods	"	424,799	386,993	462,547	416,240
Pneumatic casings					
For automobiles	Number	1,325,753	16,604,637	1,362,741	15,293,103
Other	"	54,923	234,316	72,391	269,858
Pneumatic tubes for automobiles					
For automobiles	"	936,745	1,775,588	1,016,384	1,740,328
Other	"	40,511	49,425	57,885	53,055
Solid Tires					
For automobiles	"	55,665	1,518,932	96,849	2,376,280
Other	Pounds	769,857	210,050	940,182	229,226
Tire repair materials	"	772,170	310,034	831,371	358,902
Rubber belting	"	2,590,057	1,269,999	3,548,468	2,032,310
Rubber hose	"	3,381,210	1,340,244	4,455,502	1,734,751
Rubber packing	"	1,149,446	546,115	1,564,492	731,306
Rubber heels and soles	"	1,734,396	699,135	1,903,502	678,798
Rubber tread	"	1,062,567	1,193,301	895,416	916,693
Other rubber manufactures	"	4,599,921	2,480,550	5,706,326	3,276,253
TOTAL			34,009,308		36,972,170

British Tire Industry and Trade in 1923

Opportunity Exists For American Cord Tires

THE situation in the British tire industry and trade during the past twelve months has shown no change in its basic factors from conditions over a period of three years. The major portion of the original tire equipment on British manufactured automobiles, trucks, motor cycles, and bicycles was supplied by Biritish firms, the Dunlop Company being far in the lead of any other, while similar equipment for American cars was supplied by well-known American tire manufacturers, and that for Continental cars (of which French and Italian form the largest bulk) was supplied by tire makers of those respective nationalities—Michelin in the case of France and Pirelli in the case of Italy. That a larger business in original equipment has been done in 1923 than in the previous three years is evident through the increasing number of motor cars sold in the British market. One competent estimate places this sales figure at 90,000 motor cars and trucks, or an increase of more than 25 per cent over the preceding year. The extent to which American tire manufacturers have benefitted by the increase may be seen from the import figures of complete cars, trucks and chassis. During the eleven months ended November 30, 1923, (the latest figures available) Great Britatin imported 15,715 passenger cars, 642 commercial vehicles, and 11,707 motor car chassis. Four-fifths of the passenger car imports and 50 per cent of the chassis came from the United States and Canada.

The Replacement Market

The other, and by far the larger side of the tire industry, namely the replacement business, has shown more flux and change. Michelin and Dunlop combined undoubtedly controlled as much as 80 per cent of all the replacement business in the United Kingdom, the remaining 20 per cent being divided between American, other European manufacturers than Michelin, and the smaller British companies. The Italian Pirelli Company is reputed to have considerably increased its British business during the year. Tires manufactured in Germany have been imported in increasing quantities, and, due to the exchange situation which has permitted their sale in the British market at prices below cost of production of British tires have become a serious competitive factor during the past twelve months.

The Tariff Situation

The year has been marked by repeated efforts on the part of British manufacturers to secure an import duty on tires. Propaganda has been fairly continuous in pointing out the serious situation of the British tire manufacturer, faced with keen competition from so many foreign sources and without tariff protection to support him.

In the case of competition from American manufacturers, much stress has been laid on the advantage which they gained during the wartime period and the "capturing" of the British market since the war by American firms which "dumped" their huge surplus production into this market at clearance prices. Representatives of American companies are firm in their stand, however, that no such charge could be sustained against the premier tire makers of the United States and Canada. The point has also been repeatedly made that the British companies have been unable to compete with European firms, which are able, through depreciated exchange rates, to undersell in the British market and still realize a substantial profit. This fact has been brought forcibly home through the ability of the Michelin company to initiate two general price reductions of approximately 10 per cent each during the past year, thus forcing the British manufacturers, as well as representatives of American tires, to follow with equal reductions in order to keep their hold on the British market. British manufacturers now point out that tires in general are cheaper than the pre-war product, and are sold below an economic price level. There has been much improvement in wearing qualities, due to a general adoption of the cord tire.

The urgent appeal for tariff protection would undoubtedly have been given immediate and affirmative recognition by the Government had the Protective Party been returned to power in the General Election on December 6. Failure to return this Party, however, has again thrown the matter into abeyance, and unless the subsequent Government can be induced to bring this within the scope of the Safeguarding of Industries Act, no duty can be imposed until another General Election takes place. It is now regarded as extremely unlikely that the Safeguarding of Industries Act will be invoked for the purpose.

Arguing in favor of a protective tariff, the Chairman of the British Tire Manufacturers' Association pointed out prior to the election that the British tire industry now comprised some 20 manufacturing firms, with a combined capitalization of £25,000,000 and a normal annual turnover of £30,000,000 and that, without increasing overhead charges or extension of plant, these British firms could so materially increase their output as to supply every tire needed in the British market. Keen foreign competition, however, had to be faced, with the result that no British tire manufacturer had paid a dividend during the past three years.

The Import and Export Trade

Efforts made by British manufacturers to regain a larger share of the home market in pneumatic casings and tubes have met with some success, resulting in a decline of imports of those commodities during the past year compared with 1922. Due allowance must be made, however, for price reductions and the fact that re-exports decreased correspondingly, showing a larger precentage of the imports retained for home consumption. In the absence, therefore, of quantity figures, which are not included until the returns for the entire year are available, the values quoted in the following table are not conclusive as evidence of materially decreasing foreign competition but serve to show the trend only.

British Imports and Exports of Tires and Tubes

	11 Months ended November, 30,		
Imports	1921	1922	1923
Pneumatic:			
Outer Covers	3,297,812	3,540,038	2,784,136
Inner Tubes	273,957	361,538	330,559
Solid Tires	183,135	119,861	252,051
Re-exports			
Pneumatic:			
Outer Covers	319,322	238,201	148,552
Inner Tubes	23,887	23,376	21,317
Solid Tires	61,547	11,994	13,526
Exports of British Tires			
Pneumatic:			
Outer Covers	1,243,614	1,378,578	1,446,507
Inner Tubes	282,016	251,242	258,944
Solid Tires	398,115	285,795	288,019

Outlook for 1924

Generally speaking, the British tire trade, including manufactures and importers, are looking forward to the coming tire season with increased confidence. War stocks of tires have by now been largely absorbed, and dealers are more inclined to accept heavier stocks of new goods. British manufacturers have undoubtedly gained ground through the constant propaganda to "Buy British Goods", but the demand for European and American manufactured tires continues strong, representing at least two-thirds of the replacement trade in the United Kingdom. The expanding British market for motor vehicles has naturally stimulated the tire trade and it is estimated that sales of motor vehicles next year will touch the 100,000 mark.

Fabric tires have been almost entirely supplanted by cord construction, and American makers of the latter type should find opportunity for increasing their British sales during the coming year, particularly since no tariff has been imposed.

By Assistant Trade Commissioner William M. Park, London.

EDITOR'S REVIEW DESK

Trade Catalogs **Books** **Bulletins**

SYSTEMATIC SURVEY OF RUBBER CHEMISTRY. By Clayton W. Bedford and Herbert A. Winkelmann, published by the Chemical Catalog Company, New York City. About 400 pp. Price $7.00 a copy.

This is a bibliography, with copious abstracts, of the entire literature of rubber chemistry and closely allied substances. It is perhaps the most complete reference book to rubber chemistry ever issued in this country for it is thoroughly indexed by authors and subjects and completely cross-referenced; together with a patent index and introductory chapters. summarizing the present status of rubber chemistry. No rubber chemist who desires to know where to obtain information published on rubber chemistry can afford to be without this comprehensive survey.

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THE USE OF STATISTICS OF RUBBER-GOODS EXPORTS. Trade Information Bulletin No. 172. Issued by the Rubber Division of the Department of Commerce, Washington, D. C.

This bulletin has been prepared so that rubber-goods exporters may learn how inaccuracies occur in published statistics issued by the Department of Commerce. An exact knowledge of the destinations, amounts and kinds of goods shipped to foreign markets is a direct help to the manufacturer in planning his foreign sales. By a serious study and observance of the recommendations made in this bulletin rubber statistics can be made more complete and accurate and accordingly more valuable. Every exporter is urged to study this pamphlet and to place a copy in the hands of appropriate officials and clerks for their use and guidance in making out declarations of all export shipments. Copies may be obtained upon request to the Rubber Division.

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THE TAG LINE. Catalog No. 904. C. J. Tagliabue Mnfg. Co., 18-88 Thirty-Third St., Brooklyn, N. Y. 16 pp. 3¾ x 8½ in.

This is the latest catalog issued by this company and lists the whole TAG line of thermometers and controllers. The following are illustrated and briefly described: industrial thermometers, automatic controllers, recording and dial-indicating thermometers, vacuum gages, mono gas-analysis recorders, oil testing instruments, hydrometers, laboratory thermometers and other kindred products.

* * *

AIDE-MEMOIRE POUR L'INDUSTRIE DU CAOUTCHOUC ET DES MATIERES PLASTIQUES; By A. D. Luttringer, Editor in Chief of *la Revue le Caoutchouc et la Gutta-Percha.* With Preface by A. Haller, Member of the Institute and Professor of the Sorbonne, (225 p.). A handbook of mathmetical, physical and chemical formulae and method for factory engineers, chemists, practitioners, directors and foremen. Contains ten chapters or divisions giving mathematical and physical information, formulas and mineral and organic contents, list of technical products in alphabetical order, production, composition, contents, methods of vulcanization, etc., of rubber, mechanical and physical tests, chemical analysis of rubber and principal ingredients used by the rubber industry, statistical information pertaining to rubber, other plastic substances and bibliograpy.

* * *

FACTS AFFECTING THE IMPORTATION OF RUBBER PRODUCTS INTO FINLAND; An Outline Monograph prepared by A. M. Walker of the Rubber Division of the Department of Commerce, (12 p). Finland is largely dependent on other countries for rubber articles, having only a small manufacturing industry of her own. Information regarding dealers, standards, banking facilities, postal system, tire types, discounts and trade practices, and topographical notes are also given. It is of note that while Finland has a large manufacturing industry comprising 2,291 factories employing 117,230 workers, largely devoted to lumber, pulp and paper, the country imports practically all of its rubber belting. Imports from Germany monopolize the trade in miscellaneous rubber goods.

* * *

PACKINGS; Indexed Catalogue of products of the Henry Johnson Company, Jersey City, N. J., (96 p.). Contains descriptive matter and illustrations of many kinds of rubber and other packing, belting, boiler compound, drills, rings, etc. The company stresses the necessity of care in taking measurements for packing.

* * *

SECOND YEAR BOOK, The institution of the Rubber Industry; Faraday House, 10 Charing Cross Road, London, W. C. 2, (488 p.). A summary of the work in 1922 and 1923 shows that this organization has enjoyed a remarkable growth since its foundation two years ago. Contents of the year book consists of officers, members, and committees, work done by the Institution, reports and papers read during the past year. A programme of papers to be read during the winter session, 1923-24, is also mapped out.

* * *

REPORT OF THE PROCEEDINGS at the Second Annual General Meeting of The Rubber Shareholders' Association, Ltd., (32 p.). The most noteworthy of the meeting was Mr. D. F. L. Zorn's censure of the practice of rubber companies in presenting meagre and almost meaningless financial and business statements to their shareholders.

* * *

ELECTRIC MOTORS; Pamphlet published by Reliance Electric & Engineering Co., Cleveland, Ohio, (32 p.) Illustrated expository booklet containing much information that should be of interest and value to anyone now using electric motor equipment or planning to do so. Such points as the advantages of electric power, how a motor operates, installation, load factors and cost, amount of power necessary, individual and group driving, applications of various kinds of motors and what to tell manufacturers when asking for quotations on motors are tersely described.

* * *

EVERYTHING IN INSULATION, catalog issued by Mitchell-Rand Mfg. Co., 18 Vesey St., New York City; 6 x 9"; 160 pp.; illustrated. This new enlarged edition is practically a text book on insulation materials in addition to a number of other products which can be used in the rubber plant. Of special interest to the rubber industry are the pages devoted to "Mirac," the rubber softener, and details of ebonite (hard rubber) rods, panels and tubes. The main heads are as follows: adhesives, asbestos, carbon, untreated cloths, compounds, fibre, mica, paints, rubber, tapes, twine, varnishes, waxes, wire, etc. A copy of this catalog will be sent upon request.

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JOURNAL OF THE AMERICAN-BELGIAN CHAMBER OF COMMERCE IN BELGIUM. New Monthly Publication, 24 pp. The first issue contains interesting articles concerning American-Belgian business conditions in various fields and activities of various American firms established in Belgium.

TECHNICAL ABSTRACTS

Mechanical **Chemical** **Physical**

Making Rubber from Latex

In French Patent No. 548,979 there is described a process of making rubber by the atomization of rubber latex. This is carried out by means of a disc which rotates at a high speed. The pulverized latex is then dried by means of a current of hot air. The rubber that is manufactured in this manner has a light spongy form. It can be compressed and worked just like ordinary rubber. It is claimed however that it gives results measurably superior to those obtained with ordinary rubber.

Vulcanization of Rubber

The vulcanization of rubber with the aid of sulphur chloride is the subject of German Patent No. 381,781. The vulcanization is easily accomplished at the ordinary temperatures by treatment with a solution of sulphur chloride in dry carbon tetrachloride containing a little nitrobenzene. It has been found that the last-named compound possesses powerful accelerating properties.

Vulcanizing Agent

United States Patent No. 1,481,482 has been granted to S. J. Peachey on an agent for vulcanizing rubber and a method for making the same. The substance that is obtained and used as a vulcanization accelerator consists of the condensate that is produced by heating together a paranitrosodimethylaniline homologue and sulphur. The heating is conducted at such a temperature that reaction between the two substances takes place.

Hollow Inflated Rubber Articles

United States Patent No. 1,480,376, (Miller Rubber Co.) is concerned with a process for making hollow inflated rubber articles. The method consists in expanding the hollow rubber articles during the vulcanization process by the introduction of a dry mixture into the article before vulcanization takes place. This dry mixture contains ingredients which will react in the presence of water to form a gas when heated. One ingredient of this mixture contains water of crystallization which when heated furnishes the water necessary for the aforementioned reaction. An inert mixture is also added which is intended to protect the mixture from the action of the moisture in the atmosphere.

Vulcanizing Fats

Fats and other similar substances are vulcanized by exposure to the vapors of sulphur chloride, in accordance with British Patent No. 201,531. The operation is preferably carried out in an exhausted chamber at atmospheric temperature. The process is especially adapted for varnishing or lacquering leather, artificial leather and rubber goods. The article is first coated with the fatty oil and then submitted to the action of the chloride of sulphur vapors. The untreated layer of oil may be covered with rubber so that the oil and rubber are vulcanized simultaneously.

Reactions of Accelerators During Vulcanization

Metallic oxides and organic acids, both of which have long been known as accelerators for the vulcanization of rubber by sulphur or aromatic nitro compounds, are described as inactive, one without the other. The natural or added acids in rubber dissolve the inorganic accelerators to form metallic soaps. Solution of the metallic radical in the rubber is a prerequisite to its action as an accelerator.

(No. VI—Organic Acids and Inorganic Accelerators. Paper by C. W. Bedford and H. A. Winkelmann of The B. F. Goodrich Co., Published in January, 1924 issue of *Industrial and Engineering Chemistry*. Presented before the Division of Rubber Chemistry at the 65th Meeting of the American Chemical Society, New Haven, Conn., April 2 to 7, 1923.)

The Solubility of Sulphur in Rubber

The question as to whether or not rubber adsorbs sulphur has been discussed quite extensively in the literature. In this paper it is proved by a study of the distribution of sulphur between rubber and another phase that the system obeys Henry's law and hence the sulphur is dissolved in and not adsorbed by the rubber. Figures are given showing the solubility at different temepratures and degrees of vulcanization. The bearing of this on theories of vulcanization is indicated and the possibility of using the laws of chemical kinetics to study the reaction between sulphur and rubber is pointed out.

(Abstract of paper by W. J. Kelly and K. B. Ayers of the Goodyear Tire & Rubber Co., Published in February, 1924 issue of *Industrial and Engineering Chemistry*. Presented before the Division of Rubber Chemistry at the 65th Meeting of the American Chemical Society, New Haven, Conn., April 2 to 7, 1923.)

Use of Diphenylguanidine

A few interesting notes are given regarding the use of diphenylguanidine in *Le Caoutchouc et la Gutta Percha*, page 11,793. It is stated that in the presence of substances which possess strong basic properties, such as lime, litharge and magnesia, diphenylguanidine gives perfect satisfaction. But as diphenylguanidine is itself an organic base, possessing considerably more power as an accelerator than anyone of the three compounds which have been mentioned above, it is advisable to limit the amount of these substances that are used in rubber batches that contain diphenylguanidine.

Litharge is employed in large quantities in the manufacture of rubber heels and other molded rubber goods which have to vulcanize rapidly, but it is very heavy and hence the cost of using the same is high when figured on the volume of material employed. The addition of diphenylguanidine to the rubber batch results in a considerable decrease in the weight of the same, with consequent lowering of the cost of the molded articles. Furthermore it has been found that both the mechanical strength and the durability of rubber articles, which have been made from mixtures containing diphenylguanidine have been materially enhanced.

Oxide of zinc is an excellent activating agent for many accelerators of vulcanization. It behaves very well in mixtures that contain the accelerator, diphenylguanidine. This is particularly the case when the rubber mixture contains from three to five per cent of oxide of zinc, calculated on the weight of the rubber in the mixture. When more oxide of zinc is used, the accelerating action of the diphenylguanidine is not so great. There does not seem to be any question that the accelerating power of diphenylguanidine is dependent to a large degree on the presence of oxide of zinc in the rubber batch.

The general effect of the addition of mineral oils and factice to rubber batches is to retard the vulcanization process. This is due to the fact that a greater proportion of the sulphur is converted into sulphuretted which results from the action of the mineral oils and factice on the sulphur. It is therefore advisable to increase the proportion of sulphur and also of the accelerator that is used in such mixtures to take care of this condition.

Under ordinary circumstances the regular percentage of diphenylguanidine to use in rubber mixtures should be one half of one per cent to the weight of the rubber. The proportion of sulphur used therein may be slightly reduced. In the manufacture of tires for automobiles it is customary to employ 2.25 per cent of sulphur. It is good practice to keep the percentage of sulphur as low as possible in the rubber batches as a more durable rubber is obtained in this fashion.

RUBBER STATISTICS

Import **Production** **Export**

1923 Total Imports of Belting for Machinery, of Cotton or other Vegetable Fiber, and Rubber, into the United States

From—	January Pounds	January Dollars	February Pounds	February Dollars	March Pounds	March Dollars
Denmark	280	283	....	....	....	....
France	100	143	....	....	....	....
Germany	183	755	....	....	....	....
England	24,573	22,991	17,627	21,274	52,804	35,309
Scotland	7,072	4,238	5,472	4,117	26,636	23,929
Canada—						
Maritime Province	....	....	15	10	....	....
Total	32,208	28,410	23,114	25,401	79,440	59,238

	April Pounds	April Dollars	May Pounds	May Dollars	June Pounds	June Dollars
Belgium	....	....	....	....	200	164
France	....	....	495	165	....	....
England	53,051	36,834	14,507	10,206	17,033	10,887
Scotland	19,750	16,502	19,046	14,483	6,099	4,803
Canada—						
Prairie Prov.	....	....	....	....	100	50
Japan	....	....	460	234	....	....
Total	72,801	53,336	34,508	25,088	23,432	15,904

	July Pounds	July Dollars	August Pounds	August Dollars	September Pounds	September Dollars
Denmark	840	890	14	10	....	....
Germany	....	....	240	637	....	....
England	13,018	8,932	64,190	43,119	52,225	15,860
Scotland	5,224	3,880	4,438	3,936	2,492	2,153
Canada—						
Maritime Prov.	....	....	....	....	9	6
Total	19,082	13,702	68,882	47,702	54,726	18,019

	October Pounds	October Dollars	November Pounds	November Dollars	December Pounds	December Dollars
Belgium	....	....	798	628	141	94
Germany	231	495	....	....	....	....
Norway	....	....	22,264	1,858	....	....
England	42,120	20,769	32,520	11,975	47,439	27,799
Scotland	9,299	6,474	16,010	14,678	2,241	1,521
Canada—						
Maritime Prov.	....	....	750	10	200	5
British Columbia and Yukon	....	....	1,100	360	....	....
Total	51,650	27,738	73,442	29,509	50,021	29,419

TOTAL—Entire Calendar Year 1923—583,306 pounds valued at $373,466.

1923 Total Imports of Hard Rubber Goods into the United States

From—	January Pounds	January Dollars	February Pounds	February Dollars	March Pounds	March Dollars
Austria	11,065	13,490	3,600	2,613	9,360	9,861
Germany	8,455	5,258	9,538	10,387	6,717	10,651
Spain	....	....	30	14	....	....
France	....	....	....	....	302	783
Quebec and Ontario	....	....	....	....	45	102
British Columbia & Yukon	....	....	....	....	2	3
Total	19,520	18,748	13,168	13,014	16,426	21,400

	April Pounds	April Dollars	May Pounds	May Dollars	June Pounds	June Dollars
Austria	9,750	10,236	8,019	8,743	8,583	10,055
Germany	10,224	11,731	5,786	11,706	9,882	10,148
England	320	277	180	45	187	217
France	181	563	5	3	....	....
Quebec and Ontario	20	35	65	102	....	....
Total	20,495	22,842	14,055	20,599	18,652	20,420

	July Pounds	July Dollars	August Pounds	August Dollars	September Pounds	September Dollars
Austria	23,650	9,255	11,150	11,292	....	....
Germany	12,891	18,184	16,531	13,853	9,210	12,804
England	1	1	50	225	232	327
France	....	....	....	....	3	13
Quebec and Ontario	....	....	....	....	5	6
Brit. Columbia & Yukon	....	....	9	11	....	....
Czechoslovakia	....	....	60	174	....	....
China	....	....	....	....	2	5
Total	36,542	27,440	27,800	25,555	9,452	13,155

	October Pounds	October Dollars	November Pounds	November Dollars	December Pounds	December Dollars
Austria	11,116	12,802	5,861	6,034	6,370	6,445
Czechoslovakia	....	....	....	....	70	151
Germany	24,695	28,332	12,043	17,055	12,133	16,745
Poland and Danzig	....	....	....	....	450	551
England	251	321	153	137	....	....
Quebec and Ontario	....	....	....	....	20	5
Panama	....	....	1,124	453	....	....
Total	36,062	41,455	19,181	23,679	19,043	23,897

Total—Entire Calendar Year 1923—250,396 pounds valued at $272,204.

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires

January, 1922 to December, 1923

"Production" and Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse, branch, or on a consignment basis, or abroad.

(Compiled by The Rubber Association of America, Inc.)

	PNEUMATIC CASINGS				INNER TUBES				SOLID TIRES			
MONTH	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
January, 1922	66	4,174,216	2,055,134	1,596,806	66	5 246,647	2,343,393	1,889,724	11	181,769	40,224	33,294
February, 1922	66	4,691,329	2,084,308	1,562,365	65	6,141,956	2,596,774	1,702,583	11	183,448	39,492	36,805
March, 1922	63	5,183,286	2,645,790	2,073,963	63	6,991,118	3,017,511	2,090,737	11	182,197	49,433	48,350
April, 1922	65	5,464,336	2,401,187	2,086,651	65	7,230,096	2,650,573	2,329,343	11	173,748	46,664	52,309
May, 1922	65	5,523,095	2,721,503	2,639,273	65	7,189,552	2,970,696	2,938,947	11	170,904	57,640	60,711
June, 1922	64	5,042,147	2,838,890	3,133,260	64	6,186,534	3,130,629	3,973,679	11	169,808	66,089	63,408
July, 1922	63	4,834,106	2,476,636	2,695,095	63	5,675,839	3,068,199	3,630,744	11	176,375	71,505	60,425
August, 1922	63	4,629,392	2,905,209	3,029,823	63	5,207,228	3,808,224	4,220,055	11	189,698	84,313	69,435
September, 1922	64	4,612,037	2,504,744	2,502,106	64	5,164,757	3,501,442	3,558,971	11	200,016	82,767	66,797
October, 1922	64	4,682,958	2,674,662	2,588,770	64	5,488,033	3,787,758	3,420,680	11	213,942	85,480	71,275
November, 1922	62	4,964,976	2,733,134	2,379,708	61	6,210,053	3,850,908	3,075,023	11	234,684	85,775	61,466
December, 1922	59	4,599,208	2,656,942	2,934,079	59	5,732,125	3,411,074	3,825,949	10	244,061	77,221	64,570
January, 1923	62	4,695,916	3,127,270	2,994,297	62	5,838,310	3,951,885	3,748,651	11	262,462	83,383	60,611
February, 1923	60	5,224,387	3,217,987	2,588,639	60	6,771,958	4,039,202	3,001,697	11	270,191	75,457	63,394
March, 1923	58	5,670,601	3,865,726	3,322,637	57	7,740,945	4,875,414	3,828,315	11	265,843	79,788	77,144
April, 1923	56	6,088,272	3,539,326	2,976,160	55	8,394,184	4,259,558	3,535,635	11	260,631	71,468	72,609
May, 1923	57	6,906,594	3,659,986	2,757,764	57	9,292,223	4,317,537	3,414,115	10	268,323	77,288	67,147
June, 1923	55	7,040,600	2,956,943	2,502,185	54	8 924,326	3,590,011	3,581,060	10	283,425	72,445	52,126
July, 1923	54	6,471,124	1,992,989	2,534,425	52	7,396,444	2,625,118	3,942,247	10	263,891	42,345	45,219
August, 1923	58	6,058,387	2,355,915	2,807,432	53	6,950,578	3,577,922	4,304,034	10	262,810	48,141	45,925
September, 1923	60	5,397,557	2,029,581	2,623,775	55	6,457,455	3,254,575	3,683,514	10	249,379	37,074	45,971
October, 1923	59	4,876,352	2,361,340	2,819,583	55	6,898,425	3,855,244	3,595,737	10	234,945	37,285	48,065
November, 1923	55	4,689,329	2,399,725	2,456,296	53	6,593,639	3,451,716	3,422,426	11	213,686	32,577	49,471
December, 1923	51	4,329,300	2,437,148	2,603,617	52	6,318,446	3,288,665	3,497,472	10	178,088	34,937	62,408

Report of Rims Inspected and Approved During January, 1924

SIZE	NUMBER	PCT
26 x 3 MC	2,309	0.1
28 x 3 MC	6,037	0.3
30 x 3 Cl	24,914	1.1
27 x 3½ s.s.	456	0.0
28 x 3½ s.s.	17,460	0.8
30 x 3½ Cl	1,082,463	47.0
30 x 3½ s.s.	410,123	17.8
32 x 3½	6,874	0.3
28 x 4	13,803	0.6
29 x 4	20,590	0.9
30 x 4	143	0.0
31 x 4 Cl	136,692	6.0
31 x 4 s.s.	3,907	0.2
32 x 4	260,989	11.4
33 x 4	17,074	0.7
29 x 4½	20,190	0.9
30 x 4½	690	0.0
31 x 4½	722	0.0
32 x 4½	223,737	9.7
34 x 4½	46,112	2.0
36 x 4½	483	0.0
30 x 5	987	0.0
31 x 5	50	0.0
34 x 5	5,680	0.2
34 x 7	1,139	0.0
	2,303,623	100.0

Shipments of Rubber Manufactures from the United States to Non-Contiguous Territories During the Calendar Year 1923

	Alaska		*Hawaii*		*Porto Rico*	
	Quantity	*Dollars*	*Quantity*	*Dollars*	*Quantity*	*Dollars*
Boots and Shoes (Pairs)	89,072	229,248	82,604	101,217	722,926	508,941
Druggists' rubber sundries (Pounds)	6,718	5,302	19,993	18,991	23,740	18,057
Automobile tires (Number)	2,283	29,274	114,122	1,017,437	74,062	654,414
Other tires (Number)	126	1,154	12,753	55,958	13,621	46,934
Belting, hose and packing (Pounds)	241,776	125,960	281,752	123,582	147,754	60,881
Other rubber manufactures (Pounds)	54,744	23,710	207,046	148,327	247,977	106,048
Coated and waterproofed goods (Pounds)	131,872	83,391	77,551	49,418	78,153	49,100

Comparative Statement Showing Number of Automobile Casings Shipped from the United States to Foreign Countries During 1922 and 1923

(The completion of a second calendar year during which the exports of automobile casings from the United States were reported by number (as well as by value) makes possible the publication of comparative figures showing the standing of various markets as customers for American casings. The countries of destination are arranged according to the number of automobile casings shipped to them from the United States in 1923, beginning with those countries to which largest shipments were made. The rank of the various countries as "best customers" is indicated for both 1922 and 1923. Spaces are left for the insertion of individual number of passenger cars in each country is also shown).

COUNTRY	No. of Casings Shipped by U. S. 1922	Rank as Casing Customer of U. S. 1922	No. of Casings shipped by U. S. 1923	Rank as Casing Customer of U. S. 1923	Passenger Car Registration 1/1/24
United Kingdom	340,962	1	329,394	1	479,990a
Argentina	94,685	2	108,353	2	85,000
Cuba	94,390	3	75,992	3	20,000a
New Zealand	47,846	8	73,046	4	44,864
Mexico	79,747	4	71,397	5	21,084
Canada	59,884	5	61,764	6	450,000a
Australia	41,384	10	58,770	7	109,157
Japan	7,297	29	52,943	8	8,100a
Philippine Is.	40,543	11	47,597	9	11,200a
Denmark	32,986	12	47,472	10	42,201b
Sweden	46,862	9	44,816	11	35,000a
Brit. South Africa	50,406	6	41,878	12	38,000ab
Brazil	48,033	7	32,138	13	26,400a
Norway	21,353	16	22,643	14	10,027
Brit. India & Ceylon	10,785	22	19,871	15	48,341
Uruguay	22,893	15	18,352	16	12,400a
Spain	23,058	14	18,000	17	45,000a
All Dutch East Ind.	18,928	17	15,543	18	29,910
Italy	6,260	33	14,164	19	45,000a
Netherlands	12,223	19	13,757	20	14,634
Peru	11,569	20	13,465	21	2,400a
company data for 1923. The latest available report or estimate of the					
Straits Settlements	17,161	18	12,929	23	4,000ab
Venezuela	11,407	21	11,872	24	3,400a
Dominican Republic	8,916	26	10,154	25	1,767
Panama	8,982	25	[illegible]	26	2,538
China	5,495	37	[illegible]	27	8,673
Colombia	6,080	34	[illegible]	28	2,200a
France	24,373	13	[illegible]	29	352,259
Belgium	8,215	28	[illegible]	30	45,000
Greece	8,529	27	[illegible]	31	4,000a
Jamaica	7,065	30	6,297	32	2,206
Egypt	6,736	31	6,078	33	6,000a
Br. West Africa	6,401	32	5,569	34	7,125
Palestine & Syria	10,594	24	5,196	35	2,473ab
Br. East Africa	5,576	36	4,750	36	3,513
Switzerland	1,774	48	3,728	37	16,697
Hejaz, Arabia, etc.	3,393	42	3,727	38	755ab
Canary Islands	3,742	40	3,706	39	1,305
Finland	2,154	46	3,642	40	1,500a
Trinidad & Tobago	4,191	39	3,603	41	1,600a
Germany	550	72	2,994	42	100,329
Haiti	2,177	45	2,610	43	600a
Portugal	5,748	35	2,562	44	9,000a
Chosen	1,224	54	1,745	45	1,050ab
xxOther Brit. West Indies	1,033	60	1,729	46	400a
Salvador	1,533	51	1,633	47	500a
Newfoundland & Lab.	1,202	56	1,534	48	800ab
French West Indies	3,140	43	1,504	49	1,461
Yugoslavia, Albania, etc.	2,285	44	1,487	50	1,935a
Ecuador	1,714	49	1,428	51	590a
Austria	158	85	1,315	52	10,743
Rumania	1,114	57	1,263	53	7,500a
Dutch West Indies	1,070	59	1,159	54	296
Guatemala	1,896	47	1,081	55	545
Bolivia	1,408	53	1,009	56	400a
Honduras	885	63	1,008	57	210
Costa Rica	993	61	936	58	300a
Barbados	1,219	55	790	59	1,000a
Esthonia	212	83	739	60	250a
Iceland & Faroe Is.	813	65	723	61	135a
Malta, Gozo, & Cyprus	1,694	50	644	62	350a
British Guiana	1,420	52	641	63	1,300a
Turkey	3,414	41	609	64	1,200a
Poland & Danzig	4,443	38	599	65	9,051a
Nicaragua	320	78	552	66	200ab
Czechoslovakia	647	68	474	67	6,858
Siam	439	76	429	68	1,771
Virgin Islands of U. S.	612	69	410	69	310
Other Oceania	522	73	402	70	110a
Dutch Guiana	581	70	370	71	140ab
Lithuania	225	82	367	72	400a
Hungary	...	..	364	73	2,363
Fr. Indo-China	489	74	363	74	3,922
British Oceania	683	67	342	75	99
French Oceania	262	79	336	76	140a
Algeria & Tunis	317	77	330	77	11,610
Russia in Europe	930	62	316	78	x
Other Port. Africa	553	71	289	79	500ab
Latvia	19	91	267	80	264
Portuguese East Africa	49	89	261	81	292
Morocco	815	64	252	82	3,715
British Honduras	246	80	244	83	79
Spanish Africa	692	66	219	84	...
Azores & Madeira Is.	69	87	200	85	334
Italian Africa	...	..	112	86	...
Belgian Kongo	...	..	98	87	45ab
Bulgaria	45	90	83	88	600a
Persia	154	86	81	89	850a
Other French Africa	488	75	81	90	500a
Paraguay	246	81	60	91	450a
Gibraltar	1,110	58	22	92	150ab
French Guiana	66	88	22	93	110b
Bermuda	...	..	6	94	...
Liberia	13	92	5	95	1
Russia in Asia	162	84	...	..	x
Total	1,325,753		1,362,741		

Non-Contiguous—Shipments of Automobile Tires*

Alaska	...	..	2,283	..	550a
Hawaii	...	..	114,122	..	16,825b
Porto Rico	...	..	74,062	..	8,000a

* Export figures of United States for non-contiguous territories contain both casings and tubes.

x It is estimated that in all Russia there are 14,000 motor vehicles.

xx Includes the Bahamas, Leeward Islands, the Windward Islands and other smaller British Islands of the West Indies.

a Estimated.

b Passenger cars and trucks combined; in a few instances, all motor vehicles, including motor cycles.

Tire Export Statistics

United States tire exports in 1922 and 1923

Class.	1923 Quantity.	1923 Value.	1922 Quantity.	1922 Value.
Automobile casings number	1,362,741	$15,293,103	1,325,753	$16,604,637
Automobile tubes ....do..	1,016,384	1,740,329	936,745	1,775,588
Automobile solid tires.do..	96,849	2,376,280	55,665	1,518,932
Other casings .....do..	72,391	269,858	54,923	234,316
Other tubes .....do..	57,885	53,055	40,511	49,425
Other solid tires ...pounds	940,182	229,226	769,857	210,050
Tire repair materials .do..	831,371	358,902	772,170	310,034
Total	.....	20,320,753	.....	20,702,982

Leading markets for United States tire exports

Countries.	Automobile casings. *Number.*	Automobile tubes. *Number.*	Automobile solid tires. *Number.*	Tire-repair materials. *Pounds.*
United Kingdom	329,394	201,417	31,381	75,249
Argentina	108,353	102,941	1,014	84,283
Cuba	75,992	73,476	7,369	36,349
New Zealand	73,046	37,404	5,609	46,021
Mexico	71,397	65,325	1,485	35,033
Canada	59,348	25,186	2,160	145,605
Australia	58,770	31,446	10,628	66,591
Japan	52,943	23,030	10,275	7,651
Philippine Islands	47,597	40,074	4,574	24,753
Denmark	47,472	39,245	462	17,089
Sweden	44,816	30,104	730	24,953
British South Africa	41,878	46,482	678	35,099
Brazil	32,138	25,351	650	15,607
Norway	22,643	21,073	1,184	11,957
Uruguay	18,352	9,427	268	5,550
Spain	18,000	14,318	3,536	22,060
British India	16,617	14,429	2,180	7,126
Italy	14,164	9,086	....	3,677
Netherlands	13,757	12,295	179	4,659
Peru	13,465	12,170	549	4,127
Chile	13,146	11,314	299	7,736
Straits Settlements	12,929	5,857	1,099	405
Java and Madura	12,806	8,207	2,459	3,790
Venezuela	11,872	16,272	163	3,539
Dominican Republic	10,154	12,845	637	2,838

Monthly British Rubber Statistics

January, 1924

Movements of all kinds of Rubber to and from the United Kingdom as per BOARD OF TRADE RETURNS.

IMPORTS.

From	December 1923.	December 1922.	December 1921.	Twelve Months ended December 1923.	Twelve Months ended December 1922.	Twelve Months ended December 1921.
Straits Settlements & F.M.S.	4,832	4,036	2,849	53,168	39,269	48,550
Ceylon and British India ..	1,348	1,136	1,441	14,017	13,009	18,649
Dutch East Indies, etc	805	311	698	7,668	6,694	14,950
Brazil and Peru	451	847	286	3,607	4,260	2,164
Other Countries	164	114	70	1,703	642	678
Total Tons	7,600	6,444	5,344	80,163	63,874	84,991

EXPORTS.

To	December 1923.	December 1922.	December 1921.	Twelve Months ended December 1923.	Twelve Months ended December 1922.	Twelve Months ended December 1921.
United States of America .	2,004	847	2,482	30,711	22,509	20,504
Canada	316	90	2	2,109	1,256	137
France	1,140	1,132	1,186	14,856	12,935	8,068
Belgium	142	49	45	2,882	1,077	1,142
Italy	519	200	56	4,505	2,477	1,304
Spain	32	30	10	239	384	170
Germany, Austria, Hungary	185	527	606	5,661	7,186	7,951
Russia	197	100	—	4,506	3,081	163
Sweden, Norway & Denmark	71	24	49	763	501	766
Other Countries in Europe .	144	48	99	950	946	2,613
Other Countries	17	51	—	425	422	54
Total Tons	4,767	3,098	4,535	67,607	52,774	42,872

Landings, Deliveries and Stocks in London and Liverpool as returned by the Warehouses and Wharves during the month of December

	Landed. For Dec.	Delivered. For Dec.	Stocks 31st December. 1923.	1922.	1921.
London—					
Plantation	7,433	7,259	59,898	72,165	69,612*
Other Grades	2	—	83	134	180*
Liverpool—					
Plantation	588†	727†	5,909†	7,916	8,102
Para and Peruvian	300	69	463	518	1,310
Other Grades	—	2	210	348	457
Total Tons London and Liverpool	8,323	8,057	66,563	81,081	79,661

†Official Returns from the six recognized Public Warehouses.
*Adjusted owing to stock-taking at various Wharves.

Crude Rubber Receipts at Para

	December. 1923.	December. 1922.	December. 1921.	January/December (12 months). 1923.	January/December (12 months). 1922.	January/December (12 months). 1921.
Rubber	1,950	1,860	1,825	17,170	17,422	15,347
Caucho	309	170	245	4,294	4,090	4,843
Total Tons	2,259	2,030	2,070	21,464	21,512	20,190

Importations of Crude Rubber into the United States During January, 1924

Figures compiled and distributed by The Rubber Association of America, Inc.

(Estimated net weights—long tons.)

PLANTATIONS

From	Tons
Batavia	1,065
Belawan-Deli	1,325
Colombo	2,317
Hamburg	20
Japan and Others	253
Liverpool	151
London	2,813
Malacca	847
Penang	2,036
Pt. Swettenham	1,258
Rotterdam	280
Singapore	7,673
Sourabaya	573
	20,611

AFRICANS

From	Tons
Antwerp	67
Bordeaux	34
Lisbon	1
Liverpool	58
London	21
	181

CENTRALS AND GUAYULE

Centrals(Mexico and Central America)	88
Guayule (Mexico)	—
	88

PARAS

Manoas	632
Para	99
	731

GUMS, WASTE RUBBER, ETC., IMPORTED FROM VARIOUS SOURCES

	Tons		Tons
Waste	95	Miscellaneous Gums	249
Balata	23		

Comparison 1923-1924

	JAN.-1923	JAN.-1924
Plantations	29,354	20,611
Paras	1,233	731
Africans	549	181
Central	61	88
Guayule	—	—
Manicoba and Matto Grosso	—	—
	31,197	21,611

ARRIVALS PLANTATIONS FOR JANUARY, 1924, SHOWING PORTS OF ORIGIN AND ARRIVAL

From	Arrived at	Tons
Batavia	New York	1,065
Belawan-Deli	Boston	14
Belawan-Deli	New York	1,311
Colombo	New York	2,317
Hamburg	New York	20
Japan and Others	New York	253
Liverpool	New York	151
London	Boston	14
London	New York	2,799
Malacca	Boston	125
Malacca	New York	722
Penang	Boston	28
Penang	New York	2,008
Port Swettenham	Boston	165
Port Swettenham	New York	1,093
Rotterdam	Boston	13
Rotterdam	New York	267
Singapore	Boston	332
Singapore	Los Angeles	326
Singapore	New York	7,015
Sourabaya	Boston	16
Sourabaya	New York	557
TOTAL		20,611

ARRIVALS OF PLANTATIONS BY PORTS

Atlantic Ports		
Boston	707	
New York	19,578	
		20,285
Pacific Ports		
Los Angeles	326	
		326
TOTAL		20,611

Whether You Want—

To Sell Old Equipment
To Obtain New Help
To Get Additional Capital
To Buy a Plant or
Need More Machinery

You want to reach the rubber industry *without delay.* Moral—Use the Classified Columns of THE RUBBER AGE

MARKETS

Cottons and Fabrics

NEW YORK, February 15, 1924

A steadily declining market has brought the price of raw cotton to a lower level than has been recorded since last November. Today's trading, for instance, showed a decline of 95 to 113 points in the old crop and 56 points on the new. This movement has been in effect for the past ten days and many reasons are given for its inauguration.

Among the reasons attributed are the following: Liquidation of large lines of long cotton, general selling movement, a disposition of speculators to liquidate, poor demand for manufactured goods, talk of mill curtailment, fear of strike on British docks, a report that southern markets were offering spots more freely at concessions, the issuance of an estimate of 1,995,000 bales carry-over from last season, fear of large imports of English, German and French cotton goods.

The decline was temporarily halted last week by covering and trade demand for contracts. This brought a recovery of $2 a bale leaving a loss of 10 to 18 points on the day. The following day saw a continuation of the buying movement and prices rebounded. Liverpool showed an unexpected strength, thus steadying both the New York and New Orleans markets. Prices closed on this day (February 9) with a gain of 36 to 37 points.

Early this week the selling movement started again and a decline of $2 a bale was noted. The threatened English dock strike and curtailment of production in American mills figured heavily in this decline. Yesterday witnessed one of the heaviest selling movements in months. The break represented a loss of over a cent and a quarter in the July position and brought the price to the lowest since last November. The drop was $4.75 to 5.65 a bale on the old crop.

Cotton Exports

Cotton exports for the season are as follows:

	Week ending Feb. 8.	Season to date.	Last year to date.
Great Britain	25,223	1,399,089	1,084,447
France	4,995	535,847	490,832
Germany	36,327	766,255	614,629
Japan	1,452	419,867	347,578
China	....	17,625	10,171
Mexico	300	4,144	11,180
Belgium	3,121	124,308	137,769
Denmark	....	17,602	13,000
Greece	....	921	1,080
Holland	4,019	76,776	49,471
Italy	960	372,863	333,798
Norway	....	7,150	2,563
Poland	....	....	4,256
Portugal	....	14,542	17,479
Spain	4,420	140,120	179,222
Sweden	....	36,853	32,576
Canada	3,000	99,613	123,048
Various	....	2,055	640

The range of prices follow:

	Open.	High.	Low.	Jan. 30	Feb. 14
March	32.87	33.10	31.75	33.07-09	31.78-84
May	33.25	33.27	32.05	33.38-40	32.05-10
July	31.80	31.85	30.52	32.10-14	30.52-55
Oct.	27.80	27.82	27.20	27.90	27.20
Dec.	27.30	27.38	26.80	27.43	26.75

EXTRA STAPLE COTTON

Cotton fluctuations have resulted in slightly lower quotations on extra staple since our last report. The market is firm. Egyptians have recently advanced, medium uppers being quoted at 43⅛ cents for March shipments for No. 10 and 42¾ for No. 12.

Prices on extra staple cotton, strict middling in grade and color, f.o.b., New Bedford, were quoted today as follows:

1 1-8 inch, 35½ @ 36½ cents.
1 3-16 inch, 36½ @ 37 cents.
1 1-4 inch, 38 @ 39 cents.
1 5-16 inch, 39½ cents upward.

TIRE FABRICS

Little active trading is reported. It is said that fabric mills are busy on contracts and that little new business has been placed. Until new cotton data is available, tire manufacturers are not willing to contract beyond April or May. Business is centered in a few of the leading mills with little or no sales being made other than filling contracts. Prices quoted are nominal and are showing little changes. Prices follow:

CORD FABRICS

Combed Sakellarides		Nominal	
Combed Peeler	lb.	Nominal	
Carded Peeler	lb.	.61 @	.64
Combed Egyptian uppers	lb.	Nominal	
Carded Egyptian uppers	lb.	.65 @	.67

SQUARE WOVEN

17¼-ounce Egyptian uppers, combed	lb.	Nominal	
17¼-ounce Egyptian uppers, carded	lb.	.63 @	.66
17¼-ounce Sakellarides, combed	lb.	Nominal	
17¼-ounce Peeler, combed	lb.	Nominal	
17¼-ounce Peeler, carded	lb.	.60 @	.63

(Continued on Page 389)

COTTON CONSUMPTION INCREASED IN JANUARY

Cotton consumed during January amounted to 576,604 bales of lint and 40,281 of linters, compared with 461,560 of lint and 40,892 of linters in December and 610,306 of lint and 50,535 of linters in Janaury last year, the Census Bureau announced yesterday.

Cotton on hand Jan. 31: In consuming establishments 1,633,332 bales of lint and 120,034 of linters, compared with 1,623,453 of lint and 112,949 of linters on hand Dec. 31, and 1,988,115 of lint and 145,477 of linters on hand Jan. 31, last year.

In public storage and at compresses 2,966,466 bales of lint and 82,742 of linters, compared with 3,526,164 of lint and 64,232 of linters on Dec. 31, and 3,485,952 of lint and 45,935 of linters on Jan. 31, last year.

Imports during January totaled 47,693 bales, compared with 35,601 in December and 105,215 in January, last year. Exports during January totaled 546,253 bales, including 7,263 bales of linters, compared with 845,581, including 11,660 of linters, in December, and 473,436, including 2,817 of linters, in January last year.

Cotton spindles active during January totaled 33,339,806, a reduction of 705,064 from December and of 1,897,122 from January, 1923.

Stocks on Hand

Stocks of cotton in bales exclusive of linters compare as follows with Dec. 31, 1923, and with January of last year:

	Jan. 31, 1924.	Dec. 31, 1923.	Jan. 31, 1923.
In warehouses	2,966,466	3,526,164	3,485,952
In mfg. estab.	1,633,332	1,623,453	1,988,115
Active spindles	33,339,806	34,044,878	35,236,928

Consumption of domestic and foreign cotton by American mills, exclusive of linters, compares as follows during recent months and years, by bales:

	1924.	1923.	1922.	1921.
January	576,604	610,306	526,698	266,463
	1923.	1922.	1921.	1920.
December	461,560	529,342	510,925	295,292
November	531,631	579,190	527,940	332,712
October	541,825	533,744	494,317	401,325
September	483,852	494,013	484,748	457,967
August	491,604	526,382	467,050	483,560
July	461,575	458,002	410,142	525,489
June	542,166	509,218	461,656	555,521
May	620,965	495,337	440,714	541,377
April	577,396	443,509	409,247	566,914
March	623,105	519,761	438,218	575,789
February	566,924	472,336	395,115	515,699

Home consumption in January, 1920, was 591,921 bales; in 1919 it was 557,000; in 1918 it was 524,000. Largest since 1914 was 623,105, in March, 1923; smallest, 295,292, in December, 1920.

The figures of exports in January, 1924, compare as follows in running bales:

	1924.	1923.	1922.	1921.
January	546,253	473,436	475,910	605,381
	1923.	1922.	1921.	1920.
December	845,581	607,583	639,825	788,578
November	770,002	858,337	647,695	683,323
October	781,722	798,664	802,871	583,725
September	689,435	368,890	532,839	228,068
August	244,415	273,308	423,491	146,668
July	171,469	373,242	589,962	211,841
June	214,851	491,079	495,474	241,449
May	160,368	454,947	477,389	364,904
April	259,984	598,209	319,933	546,125
March	318,210	461,484	375,180	794,460
February	359,657	338,440	493,426	640,320

The largest monthly export of cotton since the war was 929,671 bales, in January, 1920; the smallest, 146,668, in August, 1920. The smallest of war-time was 125,778 bales, in September, 1914.

For the six completed months of the cotton season home spinners' takings have been 3,087,116 bales, against 3,272,579 last year; exports have been 3,877,408 bales, against 3,380,218.

Chemicals and Compounding Ingredients

THE INDUSTRIAL CHEMICAL MARKET—NEW YORK, February 16, 1924—There was a general slackening in industrials during the past fortnight. In most industries the month of February sees the beginning of lessened production and this has its effect on the market. Prices have not changed materially, however, sellers being unwilling to shade prices. As regards the rubber industry, the present time is one of great production. Consequently there has been a lively movement of rubber chemicals and compounding ingredients. The blacks and whites have been especially active. Producers of carbon black and the zinc oxides report very satisfactory conditions in the rubber industry. Sales have been good. No let-up is expected for several months to come, for all the leading tire manufacturers are adding balloon tires to their lines and it is expected that 1924 will be a banner year.

ACCELERATORS

Organic			
Aldehyde ammonia, crystals	lb.	$ .90	@ .95
Aniline oil, drums	lb.	.17	@ .17½
Diphenylguanidine	lb.	1.05	@ 1.15
Excellerex,	lb.	.45	@ .50
Formaldehyde-Aniline	lb.	.50	@ —
Hexamethylene-tetramine	lb.	.75	@ .80
Paraphenylenediamine	lb.	1.35	@ 1.40
Super-Sulphur No. 1	lb.	.50	@ .60
Super-Sulphur No. 2	lb.	.25	@ .35
Tetramethyl—Thiuramdisulphide	lb.	6.00	@ —
Thiocarbanilide, kegs	lb.	.30	@ .35
Vulcocene	lb.	.35	@ —
Inorganic			
Lead, sublimed blue	lb.	.09¼	@ —
Lead, white	lb.	.09	@ .09½
Litharge, domestic	lb.	.11	@ —
Lime, Superfine	lb.	.01½	@ .03½
Magnesia, calcined, light,	lb.	.23	@ .24
extra light	lb.	.45	@ .60
heavy	lb.	.04½	@ .06½

COLORS

Blacks			
Arrow, "Aerfloted"	lb.	.09	@ .10
Bone Black	lb.	.05½	@ .07½
Carbon "	lb.	.07½	@ .09½
Drop "	lb.	.07½	@ .10
Ivory "	lb.	.15	@ .45
Lamp "	lb.	.12	@ .40
Micronex	lb.	.09	@ .14
Blues			
Cobalt	lb.	.21	@ .23½
Prussian		.40	@ .43
Ultramarine	lb.	.08	@ .35
Browns			
Iron oxide	lb.	.04½	@ .06½
Sienna, Italian,	lb.	.06	@ .14½
Umber, Turkey,	lb.	.04	@ —
Vandyke, domestic	lb.	.03½	@ .04
Greens			
Chrome, light	lb.	.28	@ .31
medium	lb.	.30	@ .35
dark	lb.	.32	@ .43
Commercial	lb.	.12	@ —
Reds			
Antimony crimson, 15/17% F.S.	lb.	.39	@ .50
sulphur free	lb.	.39	@ .50
golden, 15/17% F.S.	lb.	.20	@ .22
calcium and sulphur free	lb.	.40	@ —
red sulphuret 15/17% F.S.	lb.	.15	@ .16
Indian, English	lb.	.11	@ .13
Para toner	cwt.	1.00	@ 1.10
commercial		.16	@ .18
Red Oxide, reduced	lb.	.08	@ .12
pure		.12	@ .14
Toluidine toner	lb.	2.10	@ 2.25
Venetian red	lb.	.03½	@ .06
Vermillion, quicksilver, English	lb.	1.20	@ —
domestic	lb.	.25	@ .30
Whites			
Albalith	lb.	.07	@ .07½
Aluminum bronze	lb.	.55	@ .60
Asolith	lb.	.06½	@ .07
Lithopone, domestic (factory)	lb.	.06½	@ .06¾
Zinc Oxide—American Process XX red	lb.	.07⅞	@ .08⅛
Kadox, black label, bags, cars		.09½	@ —
blue " " "		.09¼	@ —
red " " "		.09	@ —
American Azo: ZZZ (lead free)	lb.	.07¾	@ .08¼
ZZ (under 5 per cent leaded)	lb.	.07	@ .07½
Z (8-10 per cent leaded)	lb.	.06¾	@ .07¼
Zinc Oxide—French Process White seal	lb.	.12	@ .12¼
Green seal	lb.	.10¾	@ .11¼
Red seal	lb.	.09¾	@ .10¼
Yellows			
Chrome, light		.17	@ .18
dark and medium	lb.	.17	@ .18
Cadmium Sulphide	lb.	1.75	@ 2.50
Ocher, French	lb.	.01¾	@ .03
domestic	lb.	.02¼	@ .03

COMPOUNDING INGREDIENTS

Aluminum flake	ton	23.00	@29.00
hydrate light	lb.	.17	@ .18
Ammonia carbonate,	lb.	.09¼	@ .10½
Barium carbonate,	ton	85.00	@90.00
Barium Dust	lb.	.05	@ .06
Barytes southern off-color,	ton	15.00	@18.00
Western, prime white	ton	22.00	@23.00
Imported	ton	30.00	@ —
Basofor	lb.	.04¼	@ —
Blanc fixe, dry f.o.b. works	lb.	.04¼	@ —
Carrara filler	lb.	.01½	@ .02
Chalk, precipitated, extra light	lb.	.04¼	@ .05
heavy	lb.	.03¼	@ .04
Clay, China, domestic,	ton	15.00	@16.50
Dixie	ton	22.00	@32.00
Blue Ridge	ton	12.00	@25.00
Fossil flour	lb.	.03	@ .05
Glues, extra white	lb.	.30	@ .40
medium white	lb.	.20	@ .26
cabinet	lb.	.18	@ .28
cabinet low grade	lb.	.15	@ .18
common bone	lb.	.11	@ .15
Graphite flake, bbls.	lb.	.06½	@ .12
amorphous	lb.	.04	@ .10
Infusorial earth, powdered	ton	60.00	@ —
bolted	ton	70.00	@ —
Liquid latex	gal.	1.25	@ 1.35
Magnesia, carbonate	lb.	.08½	@ .09
Mica, powdered	lb.	.10	@ .15
Rotten Stone (powdered)	lb.	.02½	@ .04½
Soapstone, powdered	ton	15.00	@20.00
Starch, powdered	cwt.	3.17	@ 3.44
Talc, domestic	ton	15.00	@18.00
French	ton	20.00	@ —
French, high grade	ton	40.00	@ —
Italian	ton	47.00	@58.00
Terra Alba	cwt.	1.85	@ 1.90
Tripoli, white	lb.	.02	@ .02¼
Whiting, commercial	cwt.	1.00	@ —
domestic	cwt.	13.00	@15.00
gilder's bolted	cwt.	1.10	@ —
English cliffstone	cwt.	1.50	@ —
Paris white American	cwt.	1.25	@ —
Quaker	ton	13.00	@15.00
Sussex	ton	8.00	@16.00
Wood pulp XXX	ton	35.00	@ —
" " X	ton	25.00	@ —
Zinc Oxide—lead free	lb.	.07⅞	@ —
5% leaded		.07	@ —
10% lead sulphate	lb.	.06¾	@ —
20% lead sulphate	lb.	.06¾	@ —
35% lead sulphate	lb.	.06¾	@ —

(Also see whites)

MINERAL RUBBER

Genasco (factory)	ton	50.00	@52.00
Granulated M.R.	ton	36.00	@47.00
Hard hydrocarbon	ton	30.00	@40.00
Soft hydrocarbon	ton	30.00	@40.00
320/340 M. P. hydrocarbon (c. l. factory)	ton	45.00	@50.00
300/310 M. P. hydrocarbon (c.l. factory)	ton	40.00	@45.00
Synpro, granulated, M. R. (factory)	ton	55.00	@70.00

SOFTENERS

Acids			
Acetic, 28 per cent	cwt.	3.38	@ 3.63
Cresylic, 97%	gal.	.73	@ .85
95%	gal.	.68	@ .80
Muriatic, 20%	100 lb.	1.00	@ 1.10
Nitric, 36 degrees	cwt.	4.50	@ 5.00
Sulphuric, 60 degrees	ton	11.00	@12.00
66 degrees	ton	15.00	@16.00
Tartaric, crystals	lb.	.30	@ —
Alkalies			
Caustic soda, 76%	cwt.	3.76	@ 3.91
Soda ash, 58%	cwt.	2.04	@ 2.19
Oils			
Castor, No. 3, bbls.	lb.	.14½	@ —
Chinawood, bbls.	lb.	.19	@ .19½
Corn, crude, bbls.	lb.	.11¾	@ —
refined	lb.	.13¼	@ .13½
Cottonseed, crude		8.87	@ 9.00
Glycerine,	lb.	.16½	@ .17
Linseed, domestic	gal.	.86	@ .96
Palm, Niger	lb.	.07	@ —
Lagos	lb.	.07¾	@ .08
Peanut, domestic, crude	lb.	.13	@ —
Petroleum, amber	lb.	.04¼	@ —
dark, amber		.04	@ —
Pine, steam distilled	lb.	.60	@ —
Rapeseed, refined	gal.	.85	@ .90
blown	gal.	1.00	@ nom.
Rosin, first rectified	gal.	.43	@ .45
second refined	gal.	.46	@ .47
Soya Bean		.12½	@ —
Tar, commercial	gal.	.30	@ —
Resins and Pitches			
Cumar resin, hard	lb.	.09	@ .10
soft	lb.	.09	@ .10
Parra M.R.	lb.	.06	@ .07
Tar Retort	bbl.	11.00	@ —
kiln burned	bbl.	11.00	@ —
Pitch, Burgundy	lb.	.05	@ .06
coal tar	gal.	.06	@ .08
pine	bbl.	6.50	@ —
Rosin, grade K	bbl.	6.10	@ —
Shellac, fine orange	lb.	.61	@ .62
Solvents			
Acetone, drums	lb.	.19	@ .20
Alcohol, denatured, No. 1 bbls.	gal.	.52½	@ .56½
Benzol, 90%	gal.	.21	@ .26
pure		.23	@ .28
Carbon bisulphide	lb.	.06	@ .07
Tetrachloride	lb.	.09	@ .10½
Dimethylaniline	lb.	.39	@ .41
Motor gasoline, steel bbls.	gal.	.20	@ —
Naptha, V. M. & P.	gal.	.19	@ —
Toluene	gal.	.31	@ .36
Turpentine, spirits	gal.	1.01	@ 1.02
wood	gal.	.90	@ .92
Waxes			
Bayberry	lb.	.25	@ .26
Beeswax	lb.	.40	@ .42
Carnauba, No. 1	lb.	.36	@ .40
Ceresin, white	lb.	.09	@ .10
Montan, crude	lb.	.06	@ .06½
Ozokerite, black	lb.	.23	@ .24
green	lb.	.27	@ .28
Paraffine	lb.	.04	@ .04¼
Phenol	lb.	25	@ .26
Sweet wax	lb.	.10	@ .12

SUBSTITUTES

Black	lb.	.09	@ .14
White	lb.	.10	@ .16
Brown	lb.	.10	@ .15
Brown factice	lb.	.09½	@ .13
White factice	lb.	.08½	@ .15

VULCANIZING INGREDIENTS

Black hyposulphite	lb.	.20	@ .25
Sulphur Chloride (drums)	lb.	.04	@ .05
Sulphur flour			
Commercial bags,	cwt.	1.35	@ —
" bbls.	cwt.	1.70	@ —
Superfine, bags,	cwt.	2.00	@ —
" bbls.	cwt.	2.40	@ —
100% pure, refined, bags	cwt.	2.35	@ —
100% pure, refined, bbls.	cwt.	2.60	@ —
Bergenport, bags	cwt.	2.35	@ —
" bbls.	cwt.	2.60	@ —

Chemicals

Lithopone—Demand continues satisfactory with producers working at capacity. 1923 was a record year for lithopone in the domestic market. Exports declined about 250,000 lb. over 1922 but the value for 1923 was greater by $7,000. Prices steady at 6½ @ 6¾ cents.

Zinc Oxide—Producers are pleased with the movement of zinc oxide in the rubber industry. The industry is once more beginning to show signs of prosperity and the demand is excellent. Prices remain unchanged. Exports for 1923 showed an increase of 2,100,000 pounds over 1922, the totals being 10,047,408 lb. valued at $743,577 in 1923 and 7,953,847 lb. valued at $593,128 in 1922.

Barytes—This ingredient is holding firm at former levels, with a good demand in evidence. Western prime white (St. Louis) is now quoted at $22.00 @ $23.00 a ton.

Carbon Black—The market for blacks is showing increases which are pleasing to producers. The tire industry is active and the demand for all grades is very good. "Business picking up very nicely" says one producer. A slight stiffening of the carbon black is noted, an increase of ½ cent being quoted, bring prices up to .07½ @ .09½. The balance of the list remained quiet as far as prices were concerned. Exports of carbon and lamp black during 1923 were 29,020,743 lb., valued at $4,723,166 and 17,062,311 lb. valued at $2,028,105 for 1922. It is reported from Monroe, La., that two $250,000 carbon black plants are to be erected by the Cheser Carbon Company.

Aniline Oil—Stocks of aniline have moved rather freely lately. Demand is good and prices remained practically unchanged at 17 @ 17½ cents.

Acetone—There has been a decided reduction in this solvent since our last report. At that time acetone in drums was quoted at 25 cents but to-day it may be obtained for 19 @ 19½ cents a pound. This has resulted in good trading at these prices.

Oils—There have been a number of changes in oils recently, the most notable being slight reductions in chinawood (.19 @ .19½); cottonseed (8.87 @ 9.00); linseed (.86 @ .96) and palm. Petroleum, both ambers and dark have however stiffened somewhat and are now quoted at .04¼ and .04 respectively.

Soda Ash—Contract withdrawals have been good on both the ash and caustic. Producers have signed up all the larger users and a number of the smaller ones leaving but little spot business for dealers. Prices are firm.

Scrap Rubber

NEW YORK, February 15, 1924

Scrap has been somewhat inactive in the past few weeks with what little business has been done being at shaded prices. Some prices have fallen off somewhat with others firm. No. 1 and 2 tubes have been scarce with the largest demand occuring in grey and white auto tires. Bicycle and mixed auto tires are quoted about $1.00 a ton less and boots and shoes are a shade lower than at our last writing. A slight advance is noted in solid tires but the rest were unchanged. Prices today are as follows:

Auto tire peelings	.01	@	.01⅛
Standard White auto ....ton	22.00	@	25.00
Mixed auto ....ton	12.00	@	13.00
Bicycle tires ....ton	7.00	@	8.00
Clean solid truck tires	.00⅞	@	.01
Boots and shoes	.02⅝	@	.02½
Arctics, untrimmed	.01⅝	@	.01½
Arctics, trimmed	.01⅝	@	.01¾
Inner tubes, No. 1	.03½	@	.03⅝
Inner tubes, compounded	.02⅝	@	.02½
Inner tubes, red	.02¼	@	.02⅜
Battery jars, clean hard rubber	.01	@	.01¼
Rubber Hose ....ton	10.00	@	12.00
Red packing	.01	@	.01¼
White druggist sundries	.01½	@	—
Rubber Hose ....ton	9.00	@	10.00

Crude Rubber

NEW YORK, February 15, 1924

Since our last report at the beginning of this month, the price of crude has fluctuated appreciably. Shortly after the first it started upwards and the price of first latex crepe (spot) reached 26 cents on the third of the month. Several times later this figure was reached, each time coming down ¼ to ½ cent. Each time that the price rose there was an immediate attempt to unload a large amount of stock and consequently the market fell.

Manufacturers seem to be wary of the future and are not committing themselves for more than two months at a time. London activity has scared a lot of buyers off for a period until the contemplated strike of dock workers in London is settled prices will be weak. Several other factors which have contributed to unsteadiness are the reported overtures which are being made by British growers to the Dutch planters in an attempt to get their cooperation in the matter of restriction, and the uncertainty existing as to the amounts of stocks carried here, in London and in the Far East. One authority states that there has been a reduction of over 40,000 tons during the past year. Of this 25,000 is said to be in the Far East and the balace in English ports. It is claimed that the stocks in this country have not depreciated appreciably.

In some quarters there was unwillingness to quote on distant futures because of the fact that rubber consumption in this country for the first half of 1924 is expected to set new records and with restriction in force, it is expected that the visible world supply will be materially lowered.

The market today is steady, both here and in London, while Singapore is easy. The lower grades have been inactive with quotations unchanged. Prices quoted today are as follows:

NEW YORK MARKET

Plantations—			
Ribbed Smoked Sheets:			
Spot	.25⅝	@	—
March	.25⅝	@	—
April	.25⅞	@	—
April-June	.26⅛	@	—
July-September	.26⅜	@	—
First Latex, crepe, spot	.25⅜	@	—
Amber Crepe No. 1, spot	.25¼	@	—
" " No. 2,	.24⅝	@	—
" " No. 3,	.24⅜	@	—
" " No. 4,	.24⅛	@	—
Brown Crepe, Rolled	.24¾	@	—
" " Clean, thin	.24½	@	—
" " Specky	.24¼	@	—
Scrap, Colombo No. 1	.21	@	—
Pontianac—			
Prime Pressed	.13	@	.14
Palembang	nominal		
Bangermassin	.09	@	—
Sarawak	.07¾	@	—
Paras—			
Up-river Fine	.21	@	—
" Medium	.19½	@	—
" Coarse	.17½	@	—
Islands, fine	.19	@	—
" medium	nominal		
" coarse	.11½	@	nom.
Cameta	.12	@	nom.
Madeira Fine	.23	@	—
Acre Bolivian, fine	.21	@	—
Cut Beni Bolivian, fine	.22	@	—
Tapajos, fine	.19¼	@	—
Xingu Ball	.18	@	—
Caucho Ball—			
Upper, shipment	.19½	@	—
Lower, "	.18	@	—
Centrals—			
Central, scrap, prime	.17	@	—
Corinto, scrap	.17¼	@	—
Esmeralda, sausage	.17½	@	—
Guayule, w and d.	.25	@	.26
Africans—			
Benzuela, No. 1	.16	@	—
" No. 2	.15	@	—
Congo, upper, black	.21	@	—
" " red	.21	@	—
Balata—			
Block, Colombia	.65	@	—
" Venezuela	.71	@	—
" Cindad	.75	@	—
Surinam, sheet	.77	@	—
Gutta Percha—			
Siak	.18¾	@	.19
Red Macassar	2.50	@	2.75
Chicle—			
Honduras	.64	@	.66
Mexican, Yucatan	.68	@	—

LONDON MARKET

Standard Ribbed Smoked Sheets—	
Spot	13¾ d
Mar.	13⅞
Apr.-June	14⅛
July-Sept.	14⅜

SINGAPORE MARKET

Standard Ribbed Smoked Sheets—	
Spot	13⅛ d
Mar.	13¼
Apr.-June	13¾
July-Sept.	14

Reclaimed Rubber

NEW YORK, February 15, 1924

Reclaimers are working off stocks which have accumulated in the slack months and are not producing at capacity. Demand has been good and the market as a whole has been active. Prices are firm with but few changes. Tires (white) advanced and boots and shoes showed slight declines but the rest of the grades remain unchanged. Today's quotations are as follows:

Floating Tube	.15¼	@	.15½
Friction	.22½	@	.23½
Boots and Shoes (unwashed)	.09¾	@	.10¼
Boots and Shoes (washed)	.13	@	.13¼
Mechanical	.09½	@	.10½
Hose	.10	@	.11
Tires, truck	.08¼	@	.08¾
Tires, auto, black	.08¾	@	.09¼
Black (washed)	.11	@	.11¼
White	.15½	@	.15½
Dark Gray	.10	@	.10¼
Light Gray	.11	@	.11¼

British Strike

LONDON, FEB. 18.—Dockworkers in all British ports went on strike Saturday at noon. Over 120,000 men walked out, thus tying up all shipping.

Rubber Patents

GRANTED JANUARY 29, 1924

1,481,850. Contractible Tire-Building Former. Thomas Midgley, Hampden, Mass., assignor to the Fisk Rubber Company, Chicopee Falls, Mass., a Corporation of Massachusetts.

1,481,866. Method of and Apparatus for Covering Cores. Stuart H. Heist, Penllyn, Pa., assignor to Penn Rubber Products Corp., Philadelphia, Pa., a corporation of Delaware.

1,481,892. Method and Apparatus for Vulcanizing Annular Tubes. Abram E. Falor, Akron, Ohio, assignor to the B. F. Goodrich Company, New York, a Corporation of N. Y.

1,481,895. Method and Apparatus for making rubber articles. John R. Gammeter, Akron, Ohio, assignor to the B. F. Goodrich Company, New York, N. Y., a Corporation of New York.

1,481,902. Vulcanization of Tubes. Harry H. Harders, Milwaukee, Wisconsin, assignor, by mesne assignments, to the Fisk Rubber Company, Chicopee Falls, Mass., a corporation of Massachusetts.

1,482,037. Footwear. Pearl Y. Smiley and Frederick W. Knibs, Kitchener, Ontario, Canada.

1,482,124. Self-Healing Tube. William Fetter, Baltimore, Md.

1,482,145. Mold. Joseph E. Perrault, Watertown, Mass., assignor to Hood Rubber Company, Watertown, Mass., a Corporation of Massachusetts.

1,482,217. Tire Structure. Amel B. Broluska, Detroit, Mich.

1,482,237. Combined Tire Test Gage and Valve. Wilmar F. Lent, New Haven, Conn., assignor to the Greist Mfg. Co., New Haven, Conn., a Corporation of Connecticut.

1,482,240. Tire Bead. Melvon A. Marquette, Chicopee Falls, Mass., assignor to the Fisk Rubber Company, Chicopee Falls, Mass., a Corporation of Massachusetts.

1,482,304. Tire Tool. George F. Hoag, Shavertown, N. Y.

1,482,315. Pneumatic-Tire Valve. Frederick Myers, New York, N. Y.

1,482,325. Apparatus and Method for Molding Tread Bands. Walter E. Shively, Akron, Ohio, assignor to the Goodyear Tire & Rubber Company, Akron, Ohio, a Corporation of Ohio.

1,482,336. Method of making Rubberized Fiber Composition. Burt H. Yackee, Akron, Ohio, assignor to the Goodyear Tire & Rubber Company, Akron, Ohio, a Corporation of Ohio.

1,482,340. Rubber Composition and Process of making same. George Wilson Acheson, Newark, N. J., assignor to Acheson Corp., New York, N. Y., a Corporation of Delaware.

GRANTED FEBRUARY 5, 1924

1,482,446. Apparatus for handling Air Bags in the Manufacture of Tires. Horace D. Stevens, Akron, Ohio, assignor to the Firestone Tire & Rubber Company, Akron, Ohio, a Corporation of Ohio.

1,482,456. Shoe Heel. Thomas W. Bigoney, Philadelphia, Pa.

1,482,457. Shoe Heel. Thomas W. Bigoney, Philadelphia, Pa.

1,482,689. Tire Pump. J. Herbert Landes, Norristown, Pa.

1,482,707. Machine for and Process of making hollow Rubber Articles. Frank W. Skinner, Minneapolis, Minn.

1,482,723. Bathing Cap. Louis Auster and Marie Auster, New York, N. Y.

1,482,737. Tire Alarm. Hal H. Clarke, Cherokee, Okla.

1,482,952. Reenforced-Rubber Flooring and Process of Making the Same. James Herbert Stedman, Braintree, Mass.

New Incorporations

INDIANA

Independent Rubber and Shoe Company, Fort Wayne, Ind., combination of Independent Rubber Co., and the Specialty Shoe Company. Cap. $50,000.

MAINE

St. Croix Shoe & Rubber Co., Calais, Me. $10,000, Charlotte L. Lello, Joseph L. Webber.

MASSACHUSETTS

Enterprise Rubber Heel Mfg. Co., Boston, Mass., manufacture rubber goods. $50,000. Ida E. Butman, Joseph S. Butman, Joseph Finger.

Cambridge Rubber Co., Cambridge, Mass. $500,000; 5,000 shares $100 each, 2,000 shares without par value. Warren MacPherson, Ernest W. Dunbar.

MISSOURI

Dean Rubber Mfg. Co., Kansas City, Mo. $100,000.

No Mar Rubber Co., Kansas City, Mo. $8,000. Sara Levenson, Albert H. Levenson, Eli G. Weinthal, Mildred Levenson.

NEW YORK

Rex Rubber Corp., Binghamton, N. Y. 200 shares common stock, no par value. W. J. Willey, J. Smith.

Weldo Rubber Co., Brooklyn, N. Y., make tires; $25,000; Wittner A. & R. Lader.

Yorke Rubber Co., New York City; Auto tires; $30,000. H. W. Young, E. L. Sanger.

UTAH

Davis Tire & Rubber Company, Salt Lake City, Utah; manufacture tires, tubes, rubber goods.

WASHINGTON

Mason Tire & Rubber Company of New York, Inc., Seattle, Wash. $5,000.

CAPITAL INCREASES

Delaware Tire & Rubber Co., Wilmington, Del., $10,000 to $20,000.

Samson Tire & Rubber Corp., Los Angeles, Calif. $1,000,000 to 13,000,000.

Atlas Packing & Rubber Company of Seattle, Wash. $10,000 to $20,000.

NEW TAX DECISION ON CUSHION TIRES IN SWEDEN

A circular has been issued by the Swedish Customs Office, under date of Jan. 9, 1924, announcing that a Royal Decree has changed the method of computing the weight tax to which cushion tires are subject. Heretofore it seems that cushion tires have had to pay the tax of 1.50 crowns per kilogram on not only the weight of the tire itself, but also on the weight of the rim, which is a component part of cushion tires. The following extract from the Royal Decree changing the method of computing the tax is quoted:

"On the basis of paragraph 1 of the regulations now in force concerning special taxation of rubber tires, and upon the strength of experience now gained of the road-wearing qualities of various kinds of rubber tires, His Royal Majesty has been pleased to make the following decision—to become valid as from the beginning of the year 1924 until otherwise provided for—that, upon proper application to his Royal Majesty, the weight of the iron rims fastened to the tires may be deducted in determining the taxable weight of semi-pneumatic tires of soft rubber ("cushion tires") with inner channels of at least four centimeters height and two centimeters average width, or provided with cavities corresponding to these measurements, and otherwise of a construction favorable to road protection and manufactured of good and elastic materials, all of this on condition that a statement of the weights of the iron rims, certified to by the manufacturer upon his honor, be presented at the time of levying the tax."

British West Africa

Gambia, Gold Coast, Nigeria, and Sierra Leone comprise British West Africa. Import duties are the same for all countries, no preferences being accorded. The tariff schedules of these countries specify articles usually considered luxury articles, and rubber goods not being specially mentioned or exempted are assessed duty under the general classification of "Articles not otherwise specified." The rates at present in effect are given below.

	Rate of Duty. (Ad valorem)
Gambia:	
Articles not otherwise specified	7½%
Gold Coast:	
Goods other than provisions	20%
Nigeria:	
Tires and rubber goods not otherwise specified	Free.
Toys	15%
Wearing apparel	15%
Sierra Leone:	
Articles not otherwise specified	25%

Trade Marks

JANUARY 29, 1924

(Subject to opposition within 30 days of above date)

SNOWYTE—No. 170,121. The Canfield Rubber Co., Bridgeport, Conn. For dress shields.

NEMCO—No. 187,761. New England Mills Co., Chicago, Ill. For automobile tires and tubes of rubber; valves, valve stems and parts thereof for automobile tires and radiator hose.

(Not subject to opposition)

LIQUID RUBBER—No. 178,903. The Synthetic Products Co., Cleveland, Ohio. For rubber compounding mixture, a fluid for softening, incorporating in, and treating rubber.

CHAMPION—No. 178,950. Jacob Stein, doing business as Climax Rubber Co., New York City. For drug sundries.

Labels

26,824—*Title*: GOODYEAR'S GOLD MEDAL SELF VULCANIZING TUBE REPAIR KIT TEST-THE-TENSILE. For a vulcanizing tube repair kit. Goodyear Rubber Co, Wilkes-Barre, Pa.

Prints

7,137—*Title*: GOODYEAR'S GOLD MEDAL SELF VULCANIZING PATCH. For a vulcanizing tube-repair kit.

FEBRUARY 5, 1924

TRAFFIK—No. 157,662 The Federal Rubber Co., of Illinois, Chicago, Ill., and Cudahy, Wis. For belting, and tires and casings made wholly or partly of rubber.

NADA—No. 176,442. Best & Co., Inc., New York City. For rubber footwear, leggings, puttees and gloves.

VANITY FAIR—No. 176,584. Vanity Fair Silk Mills, Reading, Pa. For gloves of leather, rubber and fabric.

ATCO—No. 177,332. Morris Steinberg, doing business as The Armstrong Tire Co., Chicago, Ill. For tires and tubes composed of rubber and fabrics and pneumatic rubber.

VARIOLASTIC—No. 187,746. Kops Bros. Inc., New York City. Elastic webbing.

Cotton Prices

(Continued from Page 386)

SHEETINGS				
40-inch	2.50-yard	yd.	.17¾ @	—
40-inch	2.85-yard	yd.	.15 @	.15½
40-inch	3.15-yard	yd.	.16 @	.16¼
40-inch	3.60-yard	yd.	.13¾ @	—
40-inch	3.75-yard	yd.	.12¾ @	.13
40-inch	4.25-yard	yd.	.10¾ @	.11
DUCKS				
Belting		lb.	.55 @	.57
Hose		lb.	.48 @	.52
Enameling		lb.	.51 @	.55
Shoe Ducks		lb.	.54 @	.58
Single filling		lb.	.23½ @	.25½
Double filling		lb.	.25½ @	.27
BURLAPS (Carload Lots)				
7½-ounce	40-inch		5.55 @	5.70
8 -ounce	40-inch		5.65 @	5.85
10 -ounce	40-inch		7.60 @	7.70
10½-ounce	40-inch		7.60 @	7.90
DRILLS				
37-inch	2.75-yard	yd.	.15½ @	.15¾
37-inch	3.00-yard	yd.	.14¾ @	.15
37-inch,	3.25-yard	yd.	.14¼ @	.14½
37-inch	3.50-yard	yd.	.14 @	—
37-inch	3.95-yard	yd.	.11½ @	.11⅝
OSNABURGS				
30-inch	7-ounce		.16 @	.16¾
40-inch	7-ounce		.17 @	.17½

New Financing for Hood

At a meeting of stockholders, held on Feb. 18, an issue of 16,000 shares of 7% new preferred stock of the Hood Rubber Co., Watertown, Mass., was authorized. The present preferred stockholders are offered the right to purchase the new stock in the ratio of one new share for each three shares now owned. Hood Rubber Company now has $4,400,000 outstanding in 7% preferred stock and the Hood Rubber Products, a subsidiary, has $1,000,000 in 7% preferred stock.

Do You Care about Good-Will ?

If the only thing a man got from advertising was cash profits, there wouldn't be nearly so many advertisers.

Advertising men know better than anybody else (except wives) that the hard-headed American business man is really a temperamental, sentimental, artist sort of person who sometimes thinks more of an unsolicited testimonial from somebody he never saw than he does of an order that was hard to get.

There is nothing more satisfying in life than the knowledge that your business enjoys the good opinion of nearly all the worth-while people in the industry.

It would be funny if a favorable public opinion didn't "pay." It would be funny if this favorable public opinion could be got for nothing, or induced with lies, or stimulated by vain boasting.

Instead of wondering whether advertising does pay or won't pay, think what it *is*, and decide from that whether you are fit to have it or not. (From an advertisement of the George Batten Co., Inc.)

The manufacturer or distributor of rubber machinery, factory equipment, chemicals, fabrics, crude rubber, etc. who does not augment his sales efforts by advertising, is losing a great deal of prestige and good-will.

THE RUBBER AGE offers you the opportunity of reaching the rubber manufacturers at a minimum of cost and a maximum of effectiveness. Write for rates.

"News While it is Still News"